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Leopoldo Lugones and Jorge Luis Borges on Science: The Garden of Forking Opinions

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Revisions to "Leopoldo Lugones and Jorge Luis Borges on Science: The Garden of Forking Opinions" by John Zehnder

In order to revise the article, I started by fixing all of the typological errors that had been noticed by reviewer 2, such as spelling mistakes, as well as issues with capitalization in my references page. I also took that reviewer's advice and reduced the scope of a pair of statements on pages 4 and 5 in order to make sure I was not making any claims in my introduction that could not be directly supported by past research literature.

Following the advice of reviewer 1, I added more detail to citations of previous literature, in order to avoid any kind of ambiguity. I also found different editions of my primary sources, which are available on line, in order to provide the reader with real in-text citation for my various quotations. Finally I added a few statements to clarify the fact that I did my own translation in order to provide the reader of my article with an English version of the quotations from the Spanish-language originals.

Leopoldo Lugones and Jorge Luis Borges on Science:

The Garden of Forking Opinions

by

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Faculty Mentor: Adriana Gordillo, Ph. D.

May 25, 2015

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The Argentine authors Leopoldo Lugones and Jorge Luis Borges are among the most famous Latin American writers of short stories. While both based some of their most distinguished works on scientific concepts, they tackled science in completely different ways. Lugones always maintained a very suspicious attitude in the face of scientific progress and its resulting modernization of society. For Lugones, science was a danger that threatened the security of both the individual and society. Consequently, in his stories, the scientist often played the role of villain, with evil intentions. In contrast, Borges incorporated the latest scientific theories into the fabric of his writing. For Borges, science played a crucial role and in many cases provided the spark of action for his plots. Often, these stories took place in mysterious worlds constructed with the help of experimental concepts, which served as tools to explore the limits of reality, and in fact could even be considered resources for innovation in and of themselves.

The first goal of the present study is to review past critiques of Lugones and Borges in order to better understand the particular perspectives they attempted to express throughout their short stories. A particular emphasis is placed on historical research that can explain how these authors' opinions were shaped by their social context. In the subsequent literary analyses, an effort is made to determine if Lugones and Borges expressed the same perspectives in their lesser-known works as they did in their most famous short stories. A definite emphasis is placed

on identifying the particular writing techniques the authors used in order to develop their perspectives.

To perform the analyses, a short story was selected from each author's body of work. These were "Acherontia Violet" by Lugones and "The Book of Sand" by Borges. Each story saw its analysis informed by past analyses of other works by the same author as well as historical information from secondary sources. In this paper, the highlights of the analysis are illustrated with quotations from the stories that not only clarify the action of the plots, but help identify the points at which the authors most saliently express their diverging opinions about science. While the original Spanish-language versions of the stories were consulted during the analyses, a decision was taken by the author to independently translate all quotations into English for the benefit of the reader.

Critically, it appears that in these particular short stories, Lugones and Borges do indeed express the same perspectives that have been identified in previous analyses of their works. In both stories, a narrator must grapple with some sort of inexplicable and incomprehensible phenomenon that breaks with his preconceived notions about the world. The encounters in both stories are crafted by combining real science with fantastical plot elements. However, the authors use these parallel structures to express wildly different opinions. In "Acherontia Violet" Lugones condemns the dangers and cruelty of science when it lacks human values. The relationship between the narrator and the mysterious phenomenon is one of revulsion and disgust. In "The Book of Sand," Borges questions not only our understanding of reality, but the entire scientific process. The relationship between his narrator and the phenomenon at hand is one of resignation to an undeniable fact about the universe. The great difference in these opinions is most likely due to the historical context in which the authors lived.

Lugones, born in 1874, matured during a momentous transformation of the southern Cone of Latin America. Around the end of the nineteenth century, Argentina industrialized at an incredible pace (Ares 5). Its cities rapidly filled with European immigrants as well as rural Argentines. Technologies, such as electric lights, streetcars, and factories, transformed every aspect of daily life. However, this transition was not an easy one, and often served to magnify societal issues that hard already been festering, including concentrated poverty, industrial pollution, and communicable disease (Ares 5). The inability of science to cure these ills left many authors disillusioned, a tendency that was exaggerated by the fact that in that era, the most respected authors were not scientists, but rather literary intellectuals with little technical training (Ares 5). Instead of describing social ills with realism or naturalism, these authors tried to escape from reality with the fantastic (Ares 6). In fact, fields of pseudoscience such as phrenology and theosophy found fertile ground in Argentina as intellectuals sought alternative ways to improve their society (Ares 6).

During this period, authors such as Lugones also felt the effects of a cultural current unique to Latin America, a general feeling that technology could not fully address the questions of the human being (Frederick 13). Many authors associated modern scientific theories with a loss of past values, and consequently judged these theories to be lacking in credibility (Frederick 62). In terms of literary style, features from the Romanticism persisted much later in Latin America than in Europe or North America. These included an emphasis on the individual, a reverence for nature, the pursuit of high-minded ideals, and an interest in the mysterious and the supernatural.

For Leopoldo Lugones, a devout Catholic, this meant a rejection of many contemporary ideas, such as evolution. For him, all ideas had to maintain roots in a system of moral or religious

values, in other words, something human. In Lugones' opinion, when these systems became disconnected, the result was always evil, a conceptualization that gave way to an image of the scientist as a hermit who single-mindedly advanced his studies without consideration for the dangers of his discoveries (Frederick 69).

One of Lugones' stories that best demonstrates his perception of science is "Acherontia Violet," published in *The Strange Forces* in 1906, in which a botanist attempts to develop a silently poisonous violet of death. The story revolves around the conception of the scientist as an immoral madman and the necessity of a link between scientific concepts and human values. Consequently, the author resorts to anthropomorphism to describe plants and impart them with human feelings. The story is narrated not from the perspective of the botanist, but rather a visitor to his experimental garden, a witness-narrator. This creates a break between the reader and the protagonist that helps cast him in a more impersonal light, thus reducing his humanity.

During the first third of the story, the narrator relates ideas about botany, as well as the recent progress of the botanist. He mentions one source of inspiration, Bernardin de Saint-Pierre, a real French Botanist from the eighteenth century who believed that plants and animals had moral values and were capable of sin ("Jacques-Henri Bernardin de Saint-Pierre: French Writer"). A premature romantic, he completely rejected the incipient industrial revolution. Lugones makes this allusion to provide an example of a scientist who did employ moral values in his work and to begin to build a case that human moral values do extend to the natural world.

The narrator also mentions August Strindberg, a nineteenth century Swedish playwright and author who believed that the physical appearance of plants and animals was analogous to other internal or environmental qualities that they experienced (Mortenson). The narrator mentions, "…there can be analogies between a flower and a pregnant woman, both supposedly

capable of receiving images of desired objects through 'cravings'" (Lugones 139). Essentially Lugones is stating that because the botanist's plants possess physical structures similar to those in human bodies, they must experience the same kinds of emotions and sensations as humans.

In the second third of the story, the narrator meets the botanist and immediately realizes, "…he loved his plants like a father, showing an obsessive devotion to them" (Lugones 142). From the beginning, this encourages the reader to view the botanist in a negative moral light as it demonstrates that he loves a group of plants more than any real human. Even worse, he tells the narrator that he nourishes his violets with toxins in their soil in order to change their color. He also exposes them to neighboring poisonous plants not only to inflict a type of chemical terror but also to sedate them with sleeping compounds, all with the goal of creating a poisonous black violet. In essence, he wants to scare his flowers as close to death as possible in order to induce the production of a compound that will cause a swift and silent end to life. This elaboration further deteriorates his moral image as it shows that he is willing to sacrifice his own children for the sake of scientific progress, a fact later revealed to be a sort of grizzly foreshadowing. In keeping with the botanist's dubious morals, the reader is never presented with a rational motivation for the experiment. The botanist is developing a flower of death simply because he can.

In the final third of the story, the botanist definitively loses the last of his moral credibility. He states that his violets are a logical subject for experiments regarding human fear because "…the human 'Ow!' is a cry from nature" (Lugones 147). He goes on to include a list of creatures that can all howl with a human shriek of terror. Once again, this elaboration about human behaviors in nature reflects Lugones' fundamental belief that human moral issues like good and evil carry weight in the natural world. However, it turns out that the botanist's efforts

have been in vain. While he has evidently succeeded in cultivating black violets and claims that they were easy to terrify, they have failed to produce the desired toxin of death. Consequently, the botanist admits, "…I decided to act out ever more shocking scenes of cruelty in front of the flowers…" (Lugones 148).

Confused, the narrator leans into the ground in an attempt to understand the botanist's meaning, However, instead of the silence he expected, the narrator hears a continuous series of screams emanating from the flowers and realizes, "During their short existence, they had done nothing but cry" (Lugones 148). This sentence proves that the flowers of the story have souls and moral senses. Whatever has been done to them, they feel strong emotions as a result. Suddenly, the narrator remembers the story of another group of plants with human senses, the myth of the mandrake. These are real plants whose roots bear a resemblance to tiny people. According to legend, they cry when watered with the blood of children. With horror, the narrator grasps the true nature of the botanist's experiment. He inquires, "Like the mandrakes?" and the botanist immediately responds, "Yes, like the mandrakes" (Lugones 149). He has been murdering children in his garden in order to terrify his plants and then bathe them in human blood.

For Lugones, the moral lesson is clear. Nature reflects the moral issues of human society, and therefore scientists must submit to a code of ethics similar to the social mores that govern human behavior in society. Lugones is illustrating quite dramatically his belief that science without limits produces horrific results. The need for a relevant moral code covering scientific issues is summarized by the narrator's final bewildered utterance regarding the botanist, "Should I report his accursed name to the public?" (Lugones 149).

In comparison, the works of Borges demonstrate an entirely different attitude, also related to the generation in which he was born. Beginning life in 1899, Borges grew up in a society with

a pattern of urban life already firmly established. Ever more abstract scientific advances continued to spread throughout the world, including such diverse theories as quantum physics and field theory. Instead of posing a threat, these developments stimulated the Borges' mind to reflect on new issues of reality and perception, as well society and cultural matters. As a result, his plots contained tools of analysis with scientific bases.

For example, in the short story "The Aleph," the story's narrator discovers a single point, the Aleph, that contains all the points in the universe, a notion inspired by Georg Cantor's theory of infinite sets (Capello 466). This theory proposes that any finite stretch of numbers on a number line contains infinity because when divided into smaller and smaller segments, it can house an unlimited amount of decimal numbers. The resulting set is symbolized by *aleph*, the first letter of the Hebrew alphabet. This letter was chosen not only because as the first letter of the alphabet, it is the root of all things, but also because its written form contains an upper half representing heaven and a lower half representing earth. Thus it can be viewed as a representation of the totality of all things, in this case not only earth but also the universe beyond. In Borges' story, the narrator, himself an author, sees the entirety of the universe in the aleph, but remains unable to describe it, a critique of the inability of authors to accurately describe reality.

A favorite scientific schema of Borges was Einstein's theory of the block universe. This theory proposes that the universe comprises four dimensions, the three typical ones, as well an additional dimension to represent time, which is imagined spatially. However, humans, with their limited perception, experience this fourth dimension as a series of photos, one at a time (Merrell 58). Another theory of time that Borges employed in his work is Hugh Everett's theory of parallel universes. This theory claims that whenever a situation has different possible results,

reality branches into two or more alternative universes (Baulch 61). Therefore, the current universe is actually neighbor to an infinite series of possible universes.

One story in which Borges integrates all of these theories is "The Book of Sand." Published in the book of the same name in 1975, it focuses on a man who buys an infinite book containing all possible pages in the universe. The story begins when a Bible salesman visits the apartment of the narrator in order to offer him a mysterious book. The narrator fears that the bookseller only wants to offer him another Bible and counters, "In this house there are some English bibles, including the first, by John Wycliffe. Likewise, I have the one by Cipriano de Valera, Luther's… …and a specimen of the Vulgate" (Borges 52). This list can be considered a metaphor for the theory of parallel universes because all of these books are derivations of the same text. In the beginning, they all shared the same story, but due to the complex series of decisions taken by their editors over time, they have become distinct versions of history, each of which could be considered the truth in alternative contexts.

However, the bookseller's offer is more than a bible and the narrator notes, "It was a volume in octavo…" (Borges 52). This is an antiquated method of printing in which sixteen pages of text are stamped on one large sheet, which is subsequently folded to produce eight double-sided sheets ("Octavo"). This method of division can be considered a metaphor for the infinite divisions present in the theory of infinite sets. The similarity continues when the narrator opens the book and along with strange drawings, notices seemingly jumbled page numbers. He remarks, "…the even page might bear the number (let's say) 40,514 and the following odd page, 999…" Once again, this serves as an allusion to the infinite numeric possibilities available between the bounds of an infinite set (Borges 52).

The bookseller claims that the book is special because it contains all images possible in the universe. Furthermore, their appearance is random, and any given image will most likely only be seen once. The narrator remains unconvinced and after spotting the drawing of an anchor sighs, “I noted the location and closed book. Immediately I reopened it. In vain, I looked for the figure of the anchor, page after page” (Borges 52). His futile efforts call to mind the limited human perception emphasized in Einstein’s theory of the block universe. Every page is essentially a slice of reality, and the reader can only experience the totality of the book one page at a time, just as humans can only experience the universe one moment at a time.

Reacting angrily to all these absurdities, the narrator shouts, “This cannot be!” symbolically confronting the complexity of the universe (Borges 53). Finally accepting the mysterious book’s authenticity, he crumbles and acquires it in exchange for one of his bibles. Like any good scientist, he continues to question the book. He employs the scientific method of inductive reasoning and intensively tests the book. For weeks, he copies down any drawings he finds but is never able to locate any repetitions. While he accepts its characteristics, he is never able to gain a full understanding of the book or its secrets. In the end, the scientific method fails to resolve the mystery, and the narrator comes to accept that he will never understand the book.

Ultimately, Borges is presenting the reader with a critique of the scientific method. He still believes that science is important, as demonstrated by the great quantity of scientific theories symbolized in his writing. However he wants to remind the reader that the scientific method cannot completely explain all of the universe’s mysteries and that in order to function properly, science must tolerate the unknown. At the very end of the story, this resignation is represented by the fact that the narrator abandons the book in the nearby national library. Thus the unknown, the book, is left to peacefully coexist with the known, the rest of the library’s collection.

In the end, "Acherontia Violet" and "The Book of Sand" appear to be quite similar in intent to other works by Lugones and Borges. Both works demonstrate the integration of real science with fantastic plot elements. However, Lugones combines scientific theories with horror in order to warn readers about the inherent risk of science without limits. In contrast, Borges combines math, physics, and time with the fantastic in order to question the possibility of any kind of knowledge and explore the limits of the scientific method. For him, unexplainable science becomes part of the fabric of the universe, and he wants readers to accept the unknown rather than treating it as a limitation.

In the long run, it appears that Borges' perspective has been quite fruitful in advancing the very fields that inspired him. For instance, his story "The Aleph" has actually inspired urban planners in Venice to gain input from a wide variety of sources in order to fully understand the almost infinite variety of problems confronting their city (Pereira and Funtowicz 69). His illustration of parallel universes throughout his work has led to subsequent developments in quantum physics, with some scientists even mentioning Borges in their papers (Baulch 61). Finally, Borges could be truly considered the inventor of the internet as his use of parallel universes as a plot device directly inspired the creation of hypertext markup language, which forms the backbone of all modern websites (Sassón-Henry 2). It seems that his vision of science and mystery coexisting at the edge of knowledge is much more flexible and enduring than Lugones' simple rejection of anything with the potential for risk.

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