

**Floyd Merrell**

***Unthinking Thinking: Borges, Mathematics and the New Physics***

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### **Floyd Merrell's *Unthinking Thinking***

Floyd Merrell's theoretically sophisticated book, *Unthinking Thinking. Jorge Luis Borges, Mathematics, and the New Physics*, aims at disclosing connections between Borges's metaphysical prose and essays and certain aspects of twentieth-century mathematics, logic, physics, and philosophy of science. Rather than assuming a causal relation in which these disciplines exert their "influences" on Borges's work, Merrell postulates the existence of an exceedingly complex cultural matrix, in which Borges, like all writers, participates. The connecting lines that Merrell very successfully maps are, in his view, the product of an "intertextuality" that is not only literary but also extends beyond the limits of literature to philosophy, mathematics, logic, and physics.

Merrell brings an unusually rich background in science, philosophy of science, and philosophy of language to his study, which begins with an illuminating chapter discussing Borges's notion of fictionality. In chapter one, "Intellection and Contemplation: An Impossible *Coniunctionis Oppositorum*," Merrell places Borges's writings within the context of the ageless realism-nominalism debate. Realism assumes that the world divides itself into objects in one definite, unique way. Nominalism, by contrast, denies that the world is intrinsically sorted in any particular way, independently of how we think about it. Thus, while for the realist there is only one world waiting for us to discover, the nominalist assumes the existence of multiple worlds depending on our different descriptions of it. Merrell examines the extent to which Borges's fictions and essays illustrate this controversy, arriving at the conclusion that in Borges's writings, the nominalistic idea that we inhabit not one world but many coexists with the realist's longing for a view *sub specie aeternitatis*. Furthermore, Merrell connects Borges's nominalism to Nelson Goodman's *Ways of Worldmaking*. Like Borges, Goodman believes that there is a plurality of different "right versions" of the world; however, none of them can claim to be the way things are. Subsequently, Merrell relates Borges's nominalistic fiction making to Hans Vaihinger's philosophy of as-if, as well as to Alexis Meinong's world of "mental objects." Ultimately, Merrell draws a further effective parallel between Borges's "many worlds" and Einstein's understanding of scientific concepts as free creations of thought. Certainly, one of the great strengths of Merrell's study lies in the intertwining of a network of multiple, interconnected relationships. This first chapter, with the conjunction of Borges with Goodman, Vaihinger, Meinong, and Einstein, is an excellent example of Merrell's strength.

In chapter two, "A Predilection for Paradox," Merrell discusses Borges's use of paradoxes. He observes that most of the the paradoxes used by Borges entail the conjunction of time and timelessness, the infinite and the finite, continuity and discontinuity, the one and the many. Merrell focuses particularly on Borges's use of Zeno's second paradox, to which Borges devotes two essays, "The Perpetual Race between Achilles and the Tortoise" and "Avatars of the Tortoise," both in *Discusión* (1932). This is the paradox of the tortoise who has a head start and

goes one length before Achilles begins. However, after Achilles has gone one length, the tortoise has gone one and one-tenth length and is still ahead: no matter how far Achilles goes, the tortoise is always one-tenth the distance ahead. Indeed, the paradox “works” by converting distance from a continuum to an infinite series of decreasing magnitudes. Zeno’s paradox, itself a pure act of mind, discloses the fact that mental constructs do not necessarily imply a correlation with our sensory experiences. Using the notions of fiction introduced in the first chapter, Merrell claims that paradoxes as mental constructs are free creations (in the sense of Einstein) or fictions (in the sense of Vaihinger and Borges). Furthermore, with the use of paradoxes, Borges, in Merrell’s view, attempts “to demonstrate that the world cannot be adequately accounted for solely by the use of logic and reason, for the ultimate consequences of such use inevitably lead to absurdities” (46).

In chapter three, “The Demise of Totalizing Quests,” Merrell extends the discussion of paradoxes, specifically those of infinity, and discusses their function in Borges’s writings. Merrell also explores Borges’s appropriations of Cantor’s set theory and Gödel’s proof, supplying useful glosses of both Gödel’s and Cantor’s theories. As opposed to the traditional view of “infinity” as a single, unimaginable large number, Georg Cantor, in the latter nineteenth century, introduced infinite sets into mathematics, regarding them as perfectly legitimate mathematical entities. Because Cantor believed that infinite sets had their own arithmetic, Merrell explains, he called them “transfinite numbers” and chose the aleph to represent them. Yet a paradox arises because, according to

Cantor, the set of all sets contains itself as a member and, hence, refers self-referentially to itself. The controversy over Cantor’s set theory, Merrell claims, led to the attempt to axiomatize number theory and to Kurt Gödel’s disturbing proof that there are some statements within number theory which cannot be proven to be true or false. This chain of events, Merrell suggests, led, in turn, to the realization that mathematics is not the absolute truth it was once supposed to be.

That Borges was familiar with Cantor’s set theory is easily proved by his discussion of Cantor in *The History of Eternity*. Furthermore, in a review of Edward Kasner and James Newman’s *Mathematics and the Imagination* (1940), Borges refers again to Cantor. Borges, Merrell argues, is strongly attracted by the idea of a set that contains itself, that is to say, a whole that both contains and is contained by the part. Accordingly, Merrell maps effective connections between Cantor’s set theory and certain of Borges’s short-stories such as “The God’s Script,” where a sentence written on a jaguar has become the universe and is contained within the universe. Moreover, Merrell skillfully relates Gödel’s proof to Borges’s “Library of Babel” and demonstrates how most of the infinite sequences insinuated in Borges’s stories close back on themselves, suggesting that “there can be no rule or algorithm for determining the nature of a system within which one finds oneself” (76). Last but not least, this chapter is also very useful in its exposition on “the loss of certainty” in mathematics, which will lead to the conviction that there is not one but many mathematics.

Merrell follows this third chapter, which primarily focussed on Borges’s link to mathematics, with an “Interlude” that describes the emergence of the “new physics,” the disappearance of the belief in an external world subject to laws independent of human mind, and the consequent tendency of science to “hyperfictionalization.” Moreover, Merrell draws interesting parallels

between the fiction-making process of both the pure scientist and Borges. Indeed this interlude serves as a smooth transition and preparation for the chapters that follow on the universe of Einsteinian physics and quantum mechanics and their relevance to Borges's works.

Chapter four, "The Universe as Library," is devoted to Einstein's conceptualization of a space-time continuum and its relation to Borges's writings. As in the previous chapters, Merrell furnishes also here helpful explanations on the scientific topics introduced. As opposed to the isolated entities of Newtonian mechanics, Einstein, in both the Special and General Theories of Relativity, presents physical reality as a unified, interconnected system. Thus, rather than regarding time as a series of omnipresent moments, Merrell explains, Einstein conceived of it as inextricably linked with space in a four dimensional matrix of spacetime. Merrell focuses on Hermann Minkowski's interpretation of the interdependence of time and space. For Minkowski, Merrell claims, everything which for each of us constitutes the past, present, and the future is given in a "block," existing prior to our knowledge of it. Yet, within his model, a given particle-observer cannot enjoy this "block" or totality because each particle-observer is trapped within her own light cone. Moreover, because each light cone exists for the path of only one particle-observer, there are no two of them that can enjoy the same panorama. Referring to Minkowski's "block" universe, Merrell claims that "this totality simply *is*, it does not become. It appears to become only to the 'traveler' along his world-line" (123). Subsequently, Merrell connects Minkowski's interpretation of Einstein's spacetime to Borges's short-story "The Library of Babel." Merrell persuasively argues that like Minkowski's particle-observer, the users of the Library in Borges's short-story describe, during their lifetime, "an almost infinitesimal world-line within the vast geometrical edifice" (124). Moreover, Merrell asserts that because the users of the Library are within the system, like the particle-observer within his light cone in Minkowski's "block" universe, they appear unable to manipulate their data and cannot decipher the Library's system.

In chapter five, "Chronos in Chains," Merrell shifts focus from the universe as Minkowski "block" to Borges's essay "New Refutation of Time" and its relation to Kurt Gödel's interpretation of the profound implications that relativity theory has for the concept of time. Merrell discusses Borges's essay "New Refutation of Time," where Borges intends to show that the negations of idealism may be extended to time. Thus, just as Berkeley denies that there is an object existing independently of our perception of it, and Hume denies that there is a subject apart from a mere collection of sensations, Borges intends to demonstrate that there is also no time. Borges proceeds on the assumption that if "man" is reduced, according to Hume, to a collection of sensations, then, a single repeated perception—either in one man's life or in the experience of two different men—suffices to prove that time (understood as succession) is a fallacy, since this repetition will destroy its linear sequence. Although Borges closes this essay by affirming the existence of time, Borges's refutation of time remains. Merrell relates Borges's refutation to Kurt Gödel's article "A Remark about the Relationship between Relativity Theory and Idealistic Philosophy." In this article Gödel argues, according to Merrell, "that a remarkable property of time, derived from relativity, is nonsimultaneity and the indeterminacy of the succession of events" (142). Accordingly, what one observer regards as happening at "the same moment," a second observer located elsewhere may regard as happening before or after that moment. Furthermore, because time cannot be "sliced" into a unique set of "nows," that is to say, because "a linear experience is not given," then, we have to conclude, Merrell suggests, that time is a "mental construct" (144). Significantly, in light of Merrell's excellent analysis, Borges's refutation is not "the anachronous *reductio ad absurdum*" that Borges himself claims it to be.

This chapter concludes with a discussion of “space-time singularities,” where time is dramatically halted altogether, and their remarkable affinity with Borges’s Aleph in his short-story “The Aleph.”

In chapter six, “What is Real?,” Merrell discusses briefly the development of quantum theory, particularly its undoing of the subject/object split. It is the notion of the objective reality of the physical world, the cornerstone of all classical physics, that has become practically obliterated in the new physics. Because of the impossibility of any sharp separation between the behaviour of subatomic particles and the interaction with the measuring instruments which serve to define the conditions under which the phenomena appear, the notion of a subject/object split proves to be no longer tenable. As Merrell points out, this idea had its beginning in contemporary science with Ernst Mach, and it is explicit in the critique of language of Fritz Mauthner. Merrell draws parallels between quantum theory’s “idealist” strain and the “idealism” of the Tlönians in Borges’s “Tlön, Uqbar, Orbis Tertius”, as well as between the role of probability in quantum theory and Borges’s “The Lottery of Babylon.” Subsequently, Merrell compares the so-called “many-worlds interpretation” of quantum mechanics, where the universe is constantly splitting into an extraordinary number of branches, with the image of the temporal labyrinth of Ts’ui Pen described in Borges’s “The Garden of Forking Paths.” He also compares the notion of intertextuality in Borges’s “Pierre Menard, Author of the *Quixote*” with David Bohm’s where each member of the whole is linked to everything else. This chapter concludes with a comparison of symmetries and asymmetries in Borges’s texts with the “broken symmetries” recently discovered at the subnuclear level, which, Merrell explains, apparently disrupt the belief in a totally harmonious universe.

In Merrell’s view, the realist-nominalist controversy with which he initiated his study seems to adopt in Borges’s writings “a form of linguistic idealism according to which we are suspended within the confines of language, unable to step outside the limitations with which we must operate” (209). In this last chapter, “Suspended within Language,” after a brief commentary on the problem of couching relativity and quantum theory in natural language, Merrell discusses the relationship between language and reality in Borges’s writings. For Borges, Merrell argues, language is the mediator by means of which he approaches reality: “Dream precedes the world,” Merrell asserts, “a conceptual gaucho stands between him (Borges) and actual gauchos, imaginary tigers between him (Borges) and actual tigers” (235-36). A constant theme in Borges’s writings, according to Merrell, is language’s deficiency and “the hopeless dream of its mirroring the world” (236). Yet words can only mirror themselves, and, at most, Merrell admits, they mirror us. In Borges’s writings, reality becomes a purely mental construct. Merrell correctly relates Borges’s conception of language to Derrida’s wellknown assertion, “*There is nothing outside the text.*” Merrell also focuses on the limitations of language, particularly on the controversial “incommensurability thesis” as understood by the “radical meaning variance” theorists such as Paul Feyerabend, Norwood Hanson, Thomas Kuhn, Michael Polanyi. According to this thesis, comparison and contrast across scientific “paradigms” or radically distinct cultures is impossible, for each conceptual framework compels one to see the world in a particular way that is unavailable to other frameworks. Merrell extends the discussion to three stories by Borges that have a bearing on these issues: “Averroes’s Search,” “The Immortal,” and “Pierre Menard, Author of the *Quixote*.”

In “Averroes’s Search,” Borges, in Merrell’s view, presents a notion akin to the incommensurability thesis. Averroes, a renowned Arabic- Hispanic scholar of the twelfth

century, does not seem to be able to make sense out of the Greek concepts “tragedy” and “comedy.” His Islamic background, which does not include the concept of theater, Merrell explains, places him in a conceptual framework apparently incommensurable with the Greek mind. Ultimately, Averroes could make sense of the two obscure Greek words by equating “tragedy” with “panegyrics” and “comedy” with “satires” and “anathemas.” Borges seems to suggest, Merrell concludes, “that an increase of *information transfer* by way of the *core constituents* can yield at least the most adequate, though always incomplete, *interpretation* under the circumstances” (228). Subsequently, Merrell refers to the narrator of “The Immortal” and his effort to understand the strange Troglydite. Whereas Averroes attempts translation between two “incommensurable” cultural and linguistic frameworks, the Troglydite’s silence does not allow the narrator any verbal clue whatsoever until their final scene. As in the case of Averroes, Merrell maintains that certain insight into the Troglydite’s world might be to a degree possible. According to Merrell, we cannot “merely jump from our world-image to another incommensurable image” (233); yet we can to a degree “oscillate” between them, whereby we gain some insight into an alien world-image. Ultimately, Merrell reconsiders “Pierre Menard, author of the *Quixote*” regarding the incommensurability thesis. In this story, the two linguistically identical texts of Cervantes and of Menard are, due to their radical distinct contextualizations, two incommensurable texts. Merrell regards Fritz Mauthner’s critique of language as the possible source that enabled Borges to approach the position of radical meaning variance theorists. Since I have been exploring the relationship between the ideas of Borges and Mauthner for a long time, Merrell’s acknowledgement of Mauthner’s critique of language seems to me relevant not only to Merrell’s discussion of Borges’s texts, but also to the current debate on episteme, for, as Merrell correctly points out, there are many affinities between philosophers like Feyerabend and Mauthner’s position regarding the conception of language as a self-contained whole. Merrell closes his brilliant study by placing Borges’s work in the context of modernism and postmodernism. In Merrell’s view, Borges’s writings represent a projection towards the postmodern insofar as Borges “abandons all fruitless quests for grounding principles.” Yet Borges’s “longing for the Absolute,” Merrell admits, “places him squarely within the modernist mind-set.”

This is a fascinating book, recommendable for its goals, scope, and knowledge of secondary material. Theoretically, the book is challenging and complex; rhetorically, it reproduces the interconnectedness it claims can be found in modern physics, skillfully interrelating Borges’s writings to physics, mathematics, and philosophies of science and language.

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