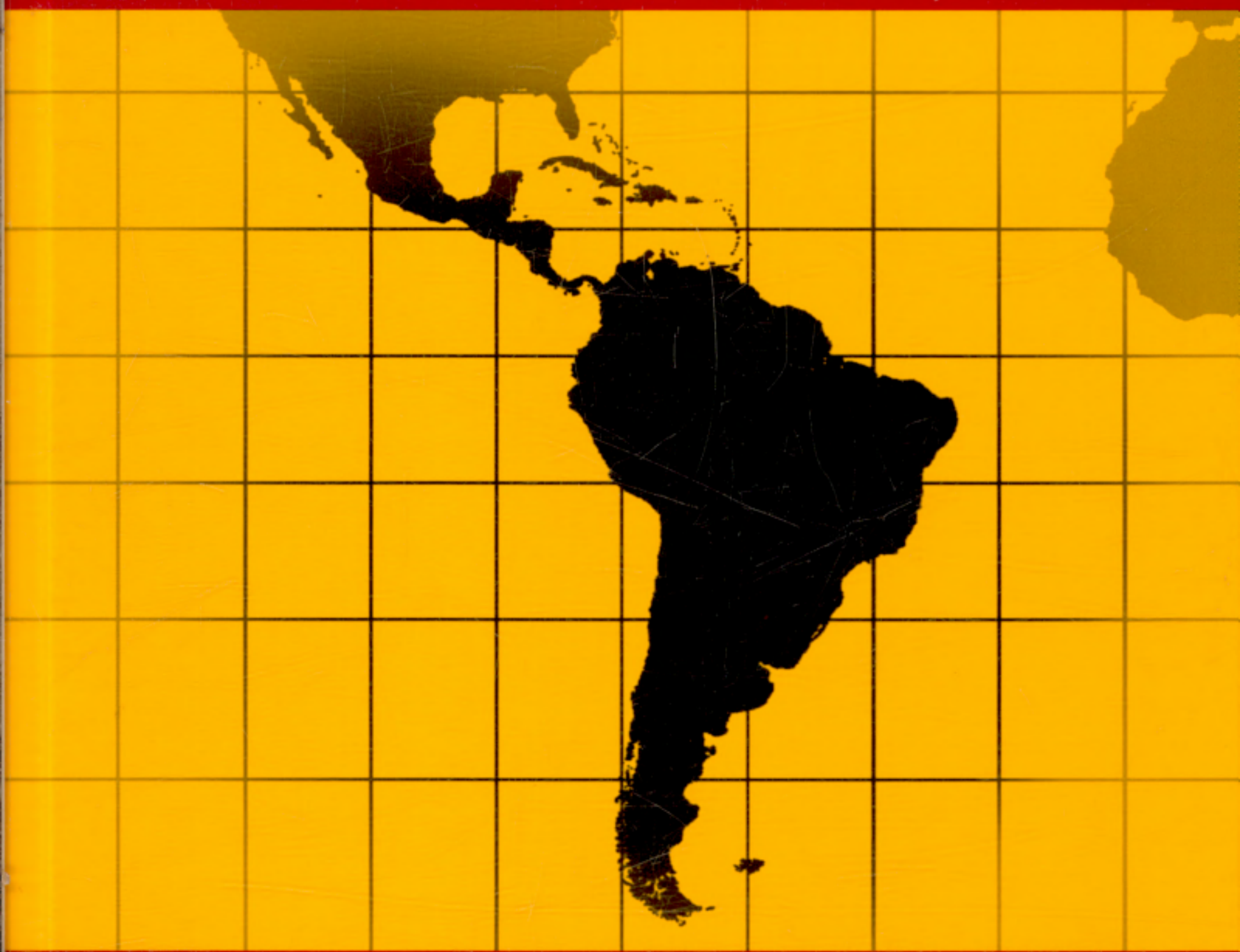
LATIN AMERICA: INTERDISCIPLINARY STUDIES

BORGES 2.0

From Text to Virtual Worlds



PERLA SASSÓN-HENRY

Perla Sassón-Henry

Borges 2.0

From Text to Virtual Worlds

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Prologue

Bridging the Gap

As happened with the invention of the printing press, the widespread use of computers has affected not only our social interaction but also our learning process and our ideas about books. These rapid technological changes challenge readers, writers, and scholars from different fields to reconsider the need to bridge the gap between science, technology, and the humanities to benefit from the capabilities present in hypermedia environments to interpret printed literature from a new perspective.

Within this framework, *Borges 2.0: From Text to Virtual Worlds* provides a critical analysis of some of Jorge Luis Borges's most fascinating stories—"The Garden of Forking Paths (1941)," "The Library of Babel" (1941), and "The Interloper" (1966)—from the point of view of their intricate relationship to science and technology.[1] My argument is grounded on the assumption that a study of these Borgesian stories through the lenses of science and technology via the theories of Gilles Deleuze, Félix Guattari, and Umberto Eco will provide a new approach to understanding Borges's work in the twenty-first century. Bearing in mind Borges's futuristic views concerning the idea of chaos and multiple times, one easily apprehends the connections between Borges's work, technology, science, hyperfiction, and new multimedia applications such as net art and video games. Moreover, Borges's position in reference to the reader, writer, and the text grounds his definition of literature, turning it into a realm inevitably affected by the time of its reading, as Borges clearly stated in his essay "A Note on (toward) Bernard Shaw":

> One literature differs from another, prior or posterior, less because of the text than because of the way in which it is read. If I were granted the possibility of reading any present-day page—this one for example—as it will be read in the year two thousand, I would know what literature of the year two thousand will be like. ("A Note on (toward) Bernard Shaw" 164)

Development of this book has been continuously inspired and challenged by the contemporary accelerating pace of technological change. These changes have illuminated more perspectives from which to interpret Borges's short stories. The title *Borges 2.0: From Text to Virtual Worlds* evokes ideas from "Web 2.0," a concept which refers to a more decentralized and collaborative Web that, like a Borgesian fiction, calls for active user/reader participation.[2] Chapter 1 describes the existent relationship between computers and

the humanities towards the end of the twentieth century. It also traces the points of convergence among oral literacy, hypertext, and Borges's interpretation of the roles of the reader, the text, and the writer. In Chapter 2, I explore the connection between hypertext electronic links and Borges's *forking paths*. Michael Joyce's seminal piece *afternoon: a story* serves as a springboard to elaborate on the similarities and differences between digital links and the Borgesian *forking paths* as portrayed in "The Garden of Forking Paths."

From Foucault's theoretical standpoint in his essay "Language to Infinity," which I refer to in order to illustrate the power of language in Borges's forking paths, I turn to the theories of Gilles Deleuze, Félix Guattari, and Umberto Eco. Thus, Chapter 3 develops as an interwoven space where Deleuze and Guattari's theoretical framework as established in *A Thousand Plateaus: Capitalism and Schizophrenia* meets Eco's theory of the open work. These theoreticians' works provide the framework to analyze Borges's fiction through the lenses of hypertext, Deleuze and Guattari's rhizomatic theory, and Eco's classification of labyrinths. In this sense, Chapter 4 focuses on the analysis of "The Library of Babel," "The Garden of Forking Paths," and the World Wide Web as rhizomatic and hypertextual environments. Whereas the first part of the chapter highlights the points of convergence and divergence in "The Library of Babel" and the World Wide Web as postmodern, decentralized, and kinetic worlds, the second part of this chapter emphasizes the struggle between logos and nomos as described by Deleuze and Guattari and applied to "The Garden of Forking Paths" and the World Wide Web.

In Chapter 5, I return to Eco's theory of labyrinths to analyze "The Library of Babel," "The Garden of Forking Paths," and the World Wide Web as mazes and labyrinthine nets. In this light, these two Borges stories are seen as literary machines whose meanings exceed their texts. As a natural bifurcation in this study, Chapter 6 leads the reader to a new terrain where literature, science, and technology interact, creating a new space to discuss Borges's short stories. In this section I argue that there exists a tripartite relationship among Borges's texts, Moulthrop's *Victory Garden,* and chaos theory. The emphasis on the dialogue among these texts via chaos theory, bifurcation theory, and noise distinguishes this analysis from earlier studies. By underscoring the reciprocal interconnectedness among Borges's stories, *Victory Garden,* scientific theory, and new media, I also acknowledge the intricate connections among print literature, digital literature, and science, and thus move towards a new interpretation of Borges's oeuvre, one that

reaffirms Borges significant role in Latin American literature and culture while acknowledging its projection into the digital age.

This constant dialogue among theory, technology, and literature is also underscored in Chapter 7, where I once again draw from Stuart Moulthrop's insights in his cybertext "Reagan Library" to illustrate the intimate relationship between Moulthrop's and Borges's work within the framework of chaos theory and bifurcation theory. Finally, in Chapter 8, I bring to the fore the alluring but also dark features of Borges's "The Interloper," which has captured the attention of media artist and scholar Natalie Bookchin. In her media experiment *The Intruder,* Bookchin mediates Borges's short story via electronic text, audio files, and a sequence of arcade video games which underscore the female character's fate.

Bookchin's *The Intruder* as well as Moulthrop's *Victory Garden* and "Reagan Library" have opened a new space for the interpretation of Borges's fiction: one that acknowledges the crucial role of literary criticism, science, and technology as represented by the evolving genre of electronic literature and video games. The path started by Borges, hyperfiction writers, and net artists has just begun to be explored. It is up to the present and future generation of scholars to engage in the fascinating process of creating and understanding works of literature that are deeply "intertwingled"[3] with technology as they challenge writers and readers to constantly develop new modes of reading, writing and interpretation.

tradition and the humanities. This framework will provide the foundations to study the relationship between hypertext and Borges's ideas concerning the reader, the writer, and the text.

Reaction to the New Medium

As with Gutenberg's invention of the printing press in the fifteenth century and other points of important change in history, the new technology has advanced accompanied by its visionaries, advocates, and opponents. There are those like David Riesman who, back in 1955, questioned the power of the new media, asserting that books were "fighting words, the gunpowder of the mind" (40). In his address delivered at Antioch College on October 5, 1955, Riesman asked "[W]hat will be the significance of the written word now that newer mass media less demanding psychologically and yet perhaps more potent politically have developed[?]" (3); yet, he finished his speech acknowledging that books "serve along with newer and the still older media to individualize, entertain and broaden [readers]" (40).

Many of those unimpressed by the new technology fear either the loss of intellectual thinking and/or the disappearance of the book in its printed form. In the afterword of *The Future of the Book,* Umberto Eco asserts that the idea that "something will kill something else is a very ancient one, and came certainly before Hugo and before the late medieval fears of Friollo" (295). Eco continues with his argument stating that

> [a]ccording to Plato (in the *Phaedrus*), Theut, or Hermes, the alleged inventor of writing, presents his invention to the pharaoh Thamus, praising his new technique that will allow human beings to remember what they would otherwise forget....My skillful Theut, he says, memory is a great gift that ought to be kept alive continuously, with your invention people will not be obliged any longer to train memory. They will remember things not because of an internal effort but by mere virtue of an external device. (295)

As Eco explains, "we can understand the pharaoh's worries" (296). The pharaoh states that "writing, as any other new technological device, would have made torpid the human power that it replaced and reinforced" (296). From the pharaoh's perspective, "writing was dangerous because it decreased the powers of the mind, offering human beings a petrified soul, a caricature of mind, a vegetal memory" (296). From Eco's perspective, Plato took a similar stance in the *Phaedrus* where he considers that "written speech might fairly be called a kind of shadow" in reference to animate speech (98).

In spite of the controversy and opposition generated by technology at different points in time, those who study the hard sciences, as well as some

humanists, keep developing new machines and software that are changing the ways scholars and students study literature. Today, hypertext, hypermedia environments, and video games are commonplace words that have been recognized by scholars as mediums to create and recreate literary narratives.

The Origins of Hypertext

The origins of hypertext can be traced back to the article "As We May Think" written by Vanevar Bush in 1945. In this article, Bush envisioned a machine called the "memex," which could supplement man's memory and would imitate man's processes of association. The main difference between the "memex" and man's memory would be the clarity and permanence of the information retrieved by storage. Douglas Engelbart's research and later prototype of a hypertext system called AUGMENT materialized Bush's prophecy. Hence, Engelbart was among the first to acknowledge the fundamentals and value of computer interaction, writing and networking, outlining, windows, electronic mail, computer conferencing, and collaborative authoring. It was Ted Nelson who coined the term "hypertext" and who designed an ongoing project in his Xanadu System[2] to promote the establishment of "intertwingled" and computerized texts on earth.

All this development of hypertext seemed to fall short for hyperfiction writer Michael Joyce, whose dream was to write a novel that could change in every reading as a result of the paths followed by the reader.[3] In order to make his dream come true, Joyce, together with Jay Bolter and Bolter's colleague John Smith, created StorySpace in 1986, a hypertextual authoring system that allowed Joyce to write the first electronic hyperfiction: *afternoon, a story.* This authoring system, though not the only one available today, opened the doors to a new genre called hyperfiction, which exploits the linking capabilities of hypertext. At around the same time, Moulthrop developed "forking paths": "a hypertextual treatment of Borges' story ["The Garden of Forking Paths"] originally intended as a demonstration for an advanced undergraduate course in narrative theory" ("Reading from the Map" 124). This work, which was created in a pre-release or beta version of StorySpace, "was not meant as literary pastiche but as probe or provocation, confronting a group of very bright students with the problem of hypertextual practice: while print may dream of multi-threaded, polymorphous texts, electronic fictions must inhabit such worlds in reality; and we with them" ("Anatomy"). Though, "forking paths" was never commercialized due to obvious copyright issues, it became one of the first hypertexts to directly

"represent a hypertextual realization of Borges' textual theorizing" ("Reading from the Map" 124).[4]

Hypertext in the Humanities

Ted Nelson's visionary statement that literature is a "system of interconnected writings" (*Literary Machines* 2/9) subliminally suggests the tight bond between computer science and the humanities. If literature is to fulfill Nelson's prediction, then concrete projects have to be developed by multidisciplinary teams. A clear example of this is George Landow's Victorian Web, which is the WWW translation of Brown University's Context 61, a course in Victorian Literature, and which serves as a resource for Victorian literature courses at Brown University.[5] In addition, the Victorian Web project has also inherited some of its contextual information from Context 32, a course taught at Brown University entitled "Survey of English literature from 1700 to the Present." This course, which was begun in Spring 1985 as part of Brown University's Institute for Research in Information and Scholarship (IRIS) Intermedia project, was funded by IBM, Apple Computers, the Annenberg/CPB Project, and other sources (Landow, "Victorian Web"). Beginning in January 2000, the University Scholars Programme (USP) at the National University of Singapore has supported the Victorian Web, which is frequently updated with contributions of scholars from around the world. Since its inception, the Victorian Web has provided scholars and students from different fields with an invaluable array of sources that contribute to a multidisciplinary approach to the study of Victorian literature.[6]

Another groundbreaking project that uses technology to disseminate humanistic studies is the Perseus project, which started in 1987 at Harvard University with contributions from other educational institutions. It contains an extensive multimedia database with sources to study ancient Greece.[7]

According to George Landow and Paul Delany, two of the first scholars to acknowledge the use of hypertext and hypermedia in literary studies, "[h]ypertext can be defined as the use of the computer to transcend the linear, bounded and fixed qualities of the traditional written text" (*Hypermedia and Literary Studies* 3). Landow and Delany write that "unlike the static form of the book, a hypertext can be composed, and read, non-sequentially; it is a variable structure composed of blocks of text (or what Roland Barthes terms *lexia*) and the electronic links that join them" (3). The reading within each block resembles conventional reading, but once the reader starts making connections and moves from one lexia to another, a new reading experience evolves. Graphic representations in the forms of trees, webs, or Chinese boxes allow the reader to picture the structure behind the screen. These

metaphors serve to direct the reader in the navigational and reading process.[8] The reading within each book resembles a conventional reading, but once the reader starts making connections and moves from one lexia to another, a new reading experience evolves.

Rapid advances in technology have taken us one step further and have included hypertext within a system that integrates audio, video, and text. This system is called *hypermedia* and is nowadays popularly represented by the World Wide Web. Hypermedia extends hypertext by integrating our visual and auditory faculties into a textual experience, linking graphic images, sound, and video to verbal signs. According to Landow and Delany, by approximating the way our mind works, hypermedia seeks to synthesize the "information received from all five senses" (7).

Hypertext is a general term that applies to as many different kinds of works or text objects as printing technology does. When considering the implications and challenges of hypertext for literary studies, one must consider that hypertext can take different forms, such as stand-alone or networked systems. Each of these systems can in turn take the form of an exploratory or a creative hypertext. Whereas exploratory hypertexts are read-only documents, creative hypertexts allow readers to write annotations within the document or to create links to other documents within a network. In this study, I will refer to the stand-alone as well as to the networked systems so that I may elaborate on the intricate connection between the development of Borgesian digital artifacts at the turn of the twentieth century and at the beginning of the twenty-first century, a period that has been marked by rapid advances in hypermedia environments. Whereas networked environments such as the World Wide Web will allow me to relate the concept of "language to infinity" proposed by Michel Foucault[9] to Borges's theory of reading, I will also refer to exploratory and creative hypertexts for the possibilities they offer from the pedagogical and theoretical perspectives. From the pedagogical standpoint, hypermedia offers a wide array of easily accessible information that promotes an interdisciplinary approach when studying the humanities. From the theoretical perspective, hypermedia entices the reader to look beyond the plateau of plot to examine in a new light the structural possibilities of texts.

Hypertext/Hypermedia: Features

> Only once in many years does a new idea appear that penetrates the way we learn, teach and structure our knowledge, and which gradually pervades the fall spectrum of media. Hypermedia and multimedia applications represent such a pervasive idea.
>
> Piet A. M. Kommers, *Hypermedia Learning Environments: Instructional Design and Integration*

Hypermedia is an extension of hypertext that includes text in the form of printed words, still images, video, and sound. This combination of different types of text and its unique capabilities makes hypermedia a powerful tool for the study of the humanities. In this section, I will refer to the features of hypermedia and later describe how they affect the process of understanding literature from a new perspective.

Hypermedia is a system that fosters the association of ideas through a linking process that imitates the way our mind works. While navigating in a hypermedia environment, readers can easily make connections between literary works and related subjects, thus helping readers to get a better understanding of the work in question and creating an infinite number of new mental constructs.[10] According to Piet A. M. Kommers, "the most prominent feature of hypermedia is the search facility in reference documents. Paper-based documents are restricted to text, tables, schematic line drawings, pictures and index lists, whereas hypermedia allows for sound and video as well. Surpassing paper-based resources, hypermedia gives a full priority to the multiple dimensions in the meanings of expressed ideas" (20). This feature is what Kommers calls "the resource metaphor." In his opinion, the "resource metaphor" "amplifies the notion that we can isolate information in some form so that it represents *what* has to be learned. You can take it with you, give it to someone else, copy it, and so forth" (21). By having easy access to an almost an unlimited database, readers can relate the text in question to innumerable nodes that can act as catalysts in the thinking process.

Another important characteristic of hypermedia is its capability to foster interaction. This interaction can take a variety of forms. One of these forms is represented by the interaction between students and what they see on the computer display. In order to make this experience a valuable one within the humanities, it is not enough to refer to the quick retrieval of texts or to texts that can contribute to the understanding of a literary work. The issue at stake here, particularly when dealing with hyperfiction and its connection to Borges's works, is not to take for granted whatever is given to us through the electronic mode but to question why such information has been given. At a time when information seems to come to us with almost no intellectual

written communication before the advent of the electronic hypertext. According to Eric Alfred Havelock in his book *The Muse Learns to Write,* the "orality problem, as it has been presented itself for investigation during the last twenty-five years, has been argued from several points of view" (24). He states that the contemporary issue is "the relationship between the spoken word of today (or yesterday) and the written text" (24). He also points out that, from a philosophical or psychological point of view, the question is whether oral communication is the instrument of an oral state of mind or a type of consciousness quite different from the literate state of mind (24). These are the two issues that I will discuss in order to illustrate the narrow gap between oral communication and hypertext.

In order to examine the relationship between the spoken word and hypertext, one must start by looking at the characteristics of oral literature before Homer's day. Many researchers have seen that period as one of illiteracy. I would prefer to use the term *non-literacy,* because the main features of oral literacy were different from those established by the written word. The period of oral literacy had its own codes that enabled the creation of quite advanced societies without having to depend on the existence of the written word, as illustrated by the civilization of the Incas of Perú. The Incas' social organization and technological advances demonstrate that they were not illiterate but rather non-literate, because they did not use the written word as means of communicating ideas or feelings. As an alternative to writing, the Incas used a system of knots in ropes called *quipu,* a system that facilitated communication and contributed to the organization and trading in the Inca empire.

Before Homer's day, oral communication relied on rhythm to promote effective memorization. This process was a key element in preserving the rules and tradition of Greek society. Through a process of association of ideas, reciters, minstrels, and ordinary people were able to transmit information. Oral communication fulfilled an entertaining as well as a didactic function in Greek society. The advent of the Greek alphabet did not all of a sudden replace the acoustic means of communication—they coexisted for a long time. Thus, the written text inherited the musicality of oral communication. Havelock writes that "Platonism, being a written text, was unable to formulate a new conceptual type of language and of thinking as a replacement for oral narrative and real thinking" (qtd. in Havelock, *The Muse Learns to Write* 29).[12] In spite of these changes in modes of communication, the written word could never fully translate what was really meant by its oral counterpart. Whereas the alphabet provided the possibilities of transcribing

anything framed and spoken, the power of orality survived through the so-called written literature of high classic Greek (Havelock, *Muse* 92).

Another important feature of oral literacy is its power as a medium for communication, generally between an individual and an audience. By establishing links between addresser and addressee, oral language fulfills its collectivist purpose, which is based on a shared code. The possibilities offered by oral literacy did not seem to suffice for the Greek society that, in order to secure tradition, invented the Greek alphabet. Through writing, the Greeks could visualize and recall what had been spoken. The Greeks invented the pure consonant, which "supplied our species with a visual representation of linguistic noise that was both economical and exhaustible" (Havelock, *Muse* 60). This system allowed the text to truly speak a language of preserved communication, a body of useful "oral information," and at the same time to store information in a more efficient way that had been done before. According to Havelock, at that time there was a "transformational change" allowing the "singing muse to translate herself into a writer" (62). In his opinion, the alphabet was created under the aegis of the singing Muse when her song was still supreme (62).

Whether we speak of oral literacy or hypertext, we are still dealing with language. The issue that brings them together is the performatory function of language: one person addresses another. Language allows for interpersonal relations just as the electronic medium allows one to overcome the intermediate barriers of the family or town to reach long distances and create what have been called "electronic communities." Hypertext embodies the oral tradition through Havelock's definition of interpersonal communication: "The genius of the unrehearsed conventional language lies in its expressiveness; its capacity to voice immediate sensations and impressions and feelings as between individuals, and also social modes and fashion and ideas as they are felt in the community. It is astonishingly flexible and mobile, and it always has been. That is what talk is" (*Muse* 64).

There is yet another aspect of the oral tradition that echoes in hypertext. Having in mind that action is a key element in the process of communication, I suggest that by allowing the reader to exert her own choices over a text, hypertext supports interaction between addresser and addressee. In the same way that oral communication entails action from the addresser to voice her sensations and impressions, hypertext demands reflection and action from the reader to create a text. Whereas oral communication allows for a dialogical exchange, creative hypertexts also allow for the addition of comments to the text, thus creating visual interaction between the text and the reader.[13] The latter feature is not unique to the electronic hypertext because, as

evidence has shown even in the first Egyptian dynasty (c. 2925–c. 2775 BC), "images of persons were also annotated with their names or titles, a further step toward expressing individuality and uniqueness" (*Encyclopædia Britannica*). The unique aspect of hypertext is its ability to incorporate comments into the text so that they become an integral part of the text, which can be visualized only as needed. In contrast to the fixity of the print medium, the mobility and flexibility of oral literacy can be compared to the dynamism and instability of the electronic text. Any step taken in a docuverse calls for a rethinking of the whole text as the reader tries to establish some type of relationship between lexias. Each node indicates a momentary position towards an attempt to grasp some understanding of the situation.

This concept resonates in Havelock's definition of communication as "a process of spontaneous exchange, varied, flexible, expressive and momentary" (*Muse* 64). This definition seems to almost overlap with David Bolter's definition of electronic writing, which he labels as "fluid and dynamic" (4). In my opinion, the process of creating and reading a hypertext is intimately related to the dynamism and flexibility of the human mind. The fact that hypertext imitates the mental process of association relates it even further to oral literacy. Within a hypertextual environment, association is always present in any text: one word echoes another word; one sentence or paragraph repeats a previous link in the text as a flashback effect and yet anticipates linking to others.

Another key feature in oral literacy as well as in hypertext is memory. For the oral legacy to survive in non-literate cultures, people had to use memory to transmit what had been told to them. According to Havelock, "recall and recollection pose the key to our civilized existence" (*Muse* 70). In the past, ritualization guaranteed the survival of language. As time went by, writing supplied us with an artificial memory that turned the flexible spoken words into a fixed state. Within this framework, it is not far fetched to see hypertext as a metaphor for the process of memorization and as a visual representation of the way the human mind operates, because hypertext allows readers to recall information, to make links between lexias, to save those connections for future reference, and to write down personal comments.[14] On many occasions, the lexias presented to the reader help not only to establish some contrast or similarity but also to trigger innovative ideas. Thus hypertext can be seen as a better environment to materialize some of the features of the spoken word because it does not contrive speech as much as printing does.

Havelock affirms that the language of oral literacy had not only rhythm but also a narrative structure to assist memorization (75). Reflection and

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Borges 2.0: From Text to Virtual Worlds analyzes Jorge Luis Borges's "The Library of Babel," "The Garden of Forking Paths," and "The Intruder" from a tripartite perspective that encompasses literature, science, and technology. This book underscores developments in chaos theory during the 1980s and their intricate connections with Borges's works and the digital world. Without losing sight of this critical framework, this study also takes into account Deleuze and Guattari's rhizome theory and Umberto Eco's theory on labyrinths. *Borges 2.0* is unique in its analysis of how Borgesian texts relate to science and technology at the same time that science and the virtual world illuminate Borges's texts to provide a new reading of his work.

"*Borges 2.0* is a perceptive and erudite study of the developing interface between, on the one hand, fiction, narrative, and literary tradition, and, on the other hand, the newer world of networked discourse and interactive stimulations. The book serves equally well on both sides of the increasingly porous border, and lives up to the intelligence and vision of its namesake."

Stuart Moulthrop, Professor, School of Information Arts and Technologies, University of Baltimore

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