

52. [Introduction] Nonlinearity and Literary Theory

Espen Aarseth's essay is neither about hypertext nor about some other type of text that is specific to the computer. How, then, did such a document insinuate itself into a book called *Hyper/Text/Theory*, and how did it manage to also work its way into one called *The New Media Reader*?

Aarseth noticed, during readings of texts that are presented or generated through computer software (such as Michael Joyce's *Afternoon*) that many of the interesting qualities of electronic literature stem not from its representation on a phosphor-lined vacuum tube (or a grid of liquid crystal) rather than a page, but from its nonlinear nature. He also noted that this quality of nonlinearity is neither insisted upon by the computer nor precluded by print. Rather than attempting to apply existing literary theory to try to explain unusual computer literary artifacts, Aarseth has developed general and yet powerful theories, theories which apply outside of new media but are based largely upon the study of new media works and those unusual aspects of text that they highlight.

The allure of the screen causes many enthusiasts to see computer literature as its own entirely new category, a view that Robert Coover considers, but does not fully embrace, in his essay ¶49. Yet just as film and print literature have common structures and influence one another, new media art and writing relate to works that are non-digital. One of the signs of the maturity of new media scholarship is that it has started to generate approaches that apply to objects outside the field.

In addition to describing a typology for nonlinear texts, Aarseth's essay makes an important contribution by discussing hypertext fiction in depth alongside interactive fiction works (a.k.a. text adventure games) such as *Adventure* and alongside conversational characters such as *Eliza/Doctor*. By going outside the boundaries of hypertext—not only to refer to print works such as *Hopscotch* but also to consider other computer software for presenting texts—Aarseth was able to identify and categorize the most salient features of nonlinear texts, rather than basing his conclusions on a group of homogeneously hypertextual works, all created—although perhaps by authors with different goals—under similar assumptions.

Another important point made in this essay is that today's electronic textual systems are not so new when systems like the telegraph are considered. Although *The New Media Reader* includes only writings from the middle of the century up through the ascendance of the Web, consideration of the history of new media certainly should not be restricted to the period after World War II.

Aarseth's *Cybertext* offers an excellent study of what are called, in this essay, nonlinear texts. It is widely cited in recent work, has been the starting point for an involved discussion on *ebr* (*Electronic Book Review*) and has inspired an edited volume, *The Cybertext Yearbook 2000*. While Aarseth has provided many insights in this essay and in *Cybertext*, one of his most important contributions has been to suggest a new ontology of texts, or textonomy, as he calls it, and to line out a category, and enumerate a set of independent features, that seem to be of both theoretical and critical interest.

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Further Reading

Aarseth, Espen. *Cybertext: Perspectives on Ergodic Literature*. Baltimore: Johns Hopkins University Press, 1997.

Bolter, Jay David and Richard Grusin. *Remediation: Understanding New Media*. Cambridge: MIT Press, 1999.

Standage, Tom. *The Victorian Internet*. New York: Walker and Company, 1998.

Michael Joyce's essay "Siren Shapes" is ¶42.

That the study of new media can inform our understanding of the old is sometimes overlooked by enthusiasts for new technologies, but it was noted by Marshall McLuhan ¶13. It has been taken up recently in the concept of media ecology, the comparative media studies approach of Henry Jenkins, and by Jay David Bolter (¶47) and Richard Grusin in their book *Remediation*.

Tom Standage's *The Victorian Internet* explores the telegraphic heritage of today's networks.

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Nonlinearity and Literary Theory

Espen J. Aarseth

Electronic writing will require a simpler, more positive literary theory.

—J. David Bolter

The future can only be anticipated in the form of an absolute danger.

—Jacques Derrida

In this essay I outline a theory of nonlinear texts and investigate some of its possible implications for the practice of literary theory and criticism. A nonlinear text is an object of verbal communication that is not simply one fixed sequence of letters, words, and sentences but one in which the words or sequence of words may differ from reading to reading because of the shape, conventions, or mechanisms of the text. Nonlinear texts can be very different from each other, at least as different as they are from the linear texts. In the conceptual framework presented here, the linear text may be seen as a special case of the nonlinear in which the convention is to read word by word from beginning to end. Recently, because of the computer, certain types of nonlinear texts have received attention from educational, technological, and theoretical circles. Now may be the time to broaden the scope of interest and to examine textual nonlinearity from a general point of view.

Over the past two decades, the spread and radical development of the computer as a means of cultural and aesthetic expression has created a challenge to the paradigms of cultural theory that has not yet been systematically answered. Studies of specific computer-mediated phenomena often suffer from a lack of insight into neighboring phenomena, again caused by a missing frame of reference, a general theoretical overview based on a broad comparative study, and a dialectic between neighboring fields. This is not least the case in literary theory, in which technological issues traditionally have been met with very little interest. During

the past decade, however, such issues have seen a marked increase of attention, perhaps not totally independent of the successful introduction of electronic word processing as an academic tool. The word processor has served to familiarize the literary scholar with *some* aspects of the new text technologies; but, due to its collaborative and emulative nature (the way electronic word processing assumes the goals of the earlier technologies), the more radical potential of textual computing is easily ignored, and the computer is gratefully perceived as less threatening than it actually is.

This essay, unlike the others in this book, is not primarily concerned with hypertext. Instead, I shall try to take a step back, to investigate the larger repertoire of textual forms of which hypertext can be said to be one. Hypertext, when regarded as a type of text, shares with a variety of other textual types a fundamental trait, which we defined as nonlinearity. It must immediately be pointed out that this concept refers only to the physico-logical form (or arrangement, appearance) of the texts, and not to any fictional meaning or external reference they might have. Thus, it is not the plot, or the narrative, or any other well-known poetic unit that will be our definitive agency but the shape or structure of the text itself. A narrative may be perfectly nonlinear (for example describing a sequence of events in a repetitive or nonsequential way) and yet be represented in a totally linear text.

The advent of computer-mediated textuality seems to have left many of those theorists and critics who noticed it in a terminological vacuum. In their eagerness to describe the brave new reality, they let a few words like *electronic* and *hypertext* cover many different phenomena. Behind the electronic text there is a large and heterogeneous variety of phenomena, and, as we shall see, a computer-mediated text may have more in common with a paper-based one than with one of its electronic brethren.

After considering some fundamental problems with the concept of textuality, I shall propose a typology of nonlinear texts based on principles extracted from various samples, and then I shall outline the main forms of nonlinearity. Since the paradigms and practice of literary theory cannot remain unaffected by its encounter with nonlinear literature, except by pretending it never happened, I both discuss new applications of literary theory and suggest some possible new departures.

Behind the Lines: What Is a Text, Anyway?

The text as a whole and as a singular whole may be compared to an object, which may be viewed from several sides, but never from all sides at once.

—Paul Ricoeur

To present nonlinear textuality as a phenomenon relevant to textual theory, one must rethink the concept of textuality to comprise linear as well as nonlinear texts. “The text,” as it is commonly perceived, entails a set of powerful metaphysics that I have no hope of dispersing here. The three most important ones are those of *reading*, *writing*, and *stability*. Regardless of mutual contradiction, these three work together to control our notion of what a text is. For our purpose, they can be summed up as follows: (1) A text is what you read, the words and phrases that you see before your eyes and the meanings they produce in your head. (2) A text is a message, imbued with the values and intentions of a specific writer/genre/culture. (3) A text is a fixed sequence of constituents (beginning, middle, end) that cannot change, although its interpretations might. In opposition to these notions, I argue that the lessons of nonlinear literature show us a textuality different from our readings (and our readings of “reading”), more fundamental than our messages, and, through the evolving rituals and technologies of use and distribution, subject to many types of change. I do not for a moment believe that my constructed binarism of the nonlinear text and the linear text or any of the other perspectives in this essay are any more free of a metaphysics than any previous textual theory, but I hope they are better suited to identifying some of the relevant issues of textual communication.

My use of the word *text* is seemingly at odds with that of certain schools of textual theory that regard the text as a semantic network of symbolic relations, loosely attached to the notion of the literary work. I do not intend to challenge that idea; I believe that it belongs to a different aspect or level of the same object. We then have two perspectives: the text as a technical, historical, and social object and the text as it is individually received and understood. These aspects, which we might call the *informative* and the *interpretable*, are governed by different rules, but they are interdependent and influence (and sometimes intrude on) each other in many ways.

The informative aspect of the text is usually the harder to see, because it is the most obvious. In addition to its visible

words and spaces, which we may call the *script*, a text includes a practice, a structure or ritual of use. Different practices adhere to different texts; we do not read *Peanuts* (the comic strip) the way we read the Bible. Of course, a rich text such as the Bible has many uses and is perused in many ways. I am not talking of interpretation here, just the algorithm and choreography that conducts the script from the text to the mind of the beholder. This may be compared (carefully) to the concept of genre, except that genre is seen prior to the text, and revered or betrayed by it; here it is the other way around.

The relationship between the text and the script requires closer attention. There is, of course, not *one* such relationship but as many as there are technologies and conventions of reading and writing. A simplistic model might depict two of the most common relationships as the following: text subordinate to script (the handwritten letter, the electronic word-processing document) and script subordinate to text (the mass-produced paper copy, the read-only CD-ROM). In the first case, whatever you do to the script affects the text; in the second, it does not. When we look for ways to describe differences between types of text, the word *electronic* usually does not get us very far.

The interpretable aspect of the text is that which makes it different; to be blunt, it is that which makes it worth reading. Formal as well as semantic elements come into play: if a text has an unusual shape, that alone arouses our interest. Most texts, however, are boringly familiar in their shape; we already know how to read them. I intend to deal with the interpretable aspect only insofar as it is affected by my discussion of the informative; to engage it fully here would be (at best) a pointless historic review of the highlights of linguistic and literary theory.

There is a problem here that goes back to a flaw at the heart of my definition of nonlinear text. When I said that a text can be nonlinear by convention, the definition is laid open to interference from the interpretable level. What if a text simply insists on its nonlinearity? Should we take its word for it? There are many such texts; Milorad Pavić's *Landscape Painted with Tea* (1990) comes to mind. From the second half, it can be read as a crossword puzzle, either “across” or “down,” following the explicit instructions given on pages 100–101. But what if a text gives us such instructions at the start, then cancels them later on? Or worse, what if the text starts by warning us against possible

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attacks of illegitimate nonlinearities, then proceeds to order us to go at once to page 50 for further instructions and skip the intervening pages that, we are told, have been contaminated by subversive directions? These hypothetical cases, which are far from impossible, illustrate a peculiar semiotic power of the linear text over the nonlinear: the linear can flirt with nonlinearity, but the nonlinear cannot lie and pretend to be linear.

But let us return to our metaphysical question, which really is a serious one: What is a text? Or, to rephrase it, Which elements and effects belong to the text and which do not? The poststructuralists are fond of discussing this question in (and in relation to) the preface or the foreword, but since I do not have such places at my disposal in this book, but only a chapter, I shall not argue with them. Instead, consider this: does the author's name belong to a text? It is usually only found outside the text—on the cover, in the catalogue, in the book review, and in some cases in the top or bottom margins of the page; but it can be argued that, along with the text's title, which is also found outside the text proper (not "enclosed" in it), the words that make up the author's name are the single most meaningful phrase of the text. Of the text, but not in the text. Imagine the difference between a text by P. G. Wodehouse and a text by Agatha Christie; no problem there. It does not even have to be any specific books; we know the difference anyway. The fact that we may know something about the authors behind these names is not anywhere near as important as what we know about a text, once we know it is by one of them. Once I pick up a book by Ken Follett, I have already started the interpretation of it, long before I have started on the first page. Even if the name itself is unknown to us, its hints of gender and cultural background are meaningful.

Authors have always known these things. In antiquity and the early Middle Ages, some writers would use the name of a famous author to get their ideas read and spread—not as a villainous forgery with the goal of short-term benefit but as a way to enhance the endurance and position of their work. Think of it as a kind of benevolent computer virus. In more recent times, female writers used male pseudonyms: the fiction was even better if a fictitious author could be constructed. Still, "serious" authors use pseudonyms for their less serious work; that way the weight of their "true" name will not mislead their readers' expectations and interpretations. This shift works well even if the connection

between the two names is known; it is the name, not the person behind it, that is important. The name belongs to the text, the writer (as in ghostwriter) does not.

Our distinction between the text and the script in the case of mass-produced and -distributed copies leads to the fundamental question of in what sense the script-independent text (the so-called real text behind all the copies) can be said to exist. This distinction may seem so much quaint and unnecessary contentiousness, but as part of the textual ontology—or, to coin a name for our field, *textonomy*—presented in this essay, it helps us to show that the stability of paper-based documents is as much a product of our metaphysical belief in a transcendental text as an inherent quality of the physical object.

Imagine a book in which some of the pages appear to be missing, or the print is unreadable every 16 pages, or some of the pages are repeated while an equal number omitted. Even if this copy is the only one we ever see, we automatically assume that it is not supposed to be this way and that a more correct version exists. It may never have been printed; but to us, who can imagine it perfectly (except for the missing words, of course), it is still more real than the one we are holding. For instance, in Terry Eagleton's *Literary Theory*, there are two chapters bearing the number one; the first titled "Introduction: What is Literature" (p.1), and the other "The Rise of English" (p.17).¹ Since my copy is from the eighth printing (1990) and the book was first published in 1983, it is unlikely that there is a version with only one first chapter, but we nevertheless assume that this is what the text meant, and that the introduction got numbered by mistake. We do this out of lack of respect for the copy; it appears to misrepresent the "real" text, even if such a thing may never have existed. In short, we prefer the imagined integrity of a metaphysical object to the stable version that we observe. Which one is more real than the other? As long as we are able to imagine and reconstruct an ideal version, everything appears to be fine, and our metaphysics remains intact. But what if the flawed version interferes so deeply with our sense of reception that it, in more than a manner of speaking, steals the show? Following our metaphysical logic, we would have to say that a new text had been created, since the alternative would be a script without a text. But, because of its unintentional origin, this new text cannot be metaphysically equal to the text it replaces, and so we are left with a paradox: some texts are metaphysical, some are not,

and if we do not know their origins, we have no way to tell the difference.

The alternative, of course, is to abandon the concept of a real text-behind-the-text altogether. On Saturday, February the 7th, 1987, I saw John Boorman's *Zardoz* (1974) at the Bergen Film Club. *Or did I?* As it happened, somehow the reels got mixed up and were projected in the sequence 1, 2, 4, 3, 5. The film is a weird, allegorical adventure, from a barbaric future in which technology has become inexplicable and supernatural to everyone but a secluded group of very bored immortals. The title is an anagrammatic allusion to *The Wizard of Oz*, and the story contains many surreal and fantastic elements—not least, it seemed to me, the sudden jump in the narrative, followed after a while by a just as strange flash-back. When the fifth reel came on, however, I slowly started to suspect that this rather crude montage technique was neither Boorman nor his film company's doing, but most likely a mistake in "reel time." By then the damage was done, and I had had the confusing privilege of being lost in the materiality of a film—a strangely appropriate experience, somewhat parallel to that of the main character, played by Sean Connery, a barbarian who manages to get into the secret place, the Vortex of the immortals, to see their strange customs and technology (and their eventual destruction) from the inside.

By virtue of the altered sequence, an unintended cinematic experience, a new expression, was created. But was it a new film? I am tempted to answer, *no*. Not because I feel that a film (or any other artistic "work") has to be the intended and consecutive design of a conscious, creative operator, but because both the original and the heretical sequences are based on the same material potential. In this sense, a text or a film is like a limited language in which all the parts are known, but the full potential of their combinations is not. The mutation of *Zardoz* was created by a hidden possibility in its channel, not by the introduction of a new code or principle.

There are many scales of change in a text's metamorphosis: unintentional (the blunders of a typesetter or projectionist in the dark), usurpatory (a re-mix of samples from a musical recording, a hacked version of a computer game), plagiarism (one composer's unacknowledged variations on a theme of another), and subversive or estranging (the "cut up" textual experiments of William Burroughs and John Cage), to suggest a few. Some of the results of some of these

operations we might accept as authentic new works, others not, according to the cultural legitimacy of their method of construction or their operator; or, in the case of a new aesthetic system, depending on contemporary empathy with the perceived political symbolism of the mode of mutation.

Textual integrity and the border between two works of art—this is hardly a startlingly original conclusion—is a cultural construct. More importantly, as I have tried to show, so is our notion of what constitutes the text itself—not only our conception of its function, meaning, or metaphysical reliability but also what it appears to be made of and what conditions have to be met for us to acknowledge its existence. What remains to be investigated, then, is the possibility that textuality exists beyond metaphysics, through location, anatomy, and temporality.

There is no sense in denying that this crisis of the text (if so pretentious a denotation must be used) is brought about by the digital wonders of the information age—or rather, by the somewhat eschatological claims of the proponents of the so-called new media: "the book is dead," "this is the Late Age of Print," "the electronic text will free us from the tyranny of paper," and "in the future, everyone will be a writer." No doubt, these are interesting times. The problem with terms such as the *electronic text* and the *printed book* is that they are, to borrow a phrase from Clifford Geertz, too "dangerously unfocused" to sustain a precise analysis. Nevertheless, this enthusiastic eschatology forces us to see dusty old things in a new light and perhaps learn a thing or two in the process.

And so the computer—that old, mythological beast—has become instrumental in everyone's quest for a new understanding of the text. The danger of turning this quest into just another metaphysics comes mainly from two sides, both of which it is impossible to avoid altogether: the vigorous rhetoric of the current generation of media prophets urging us to believe in their electronic text; and, more fundamentally, that there *is* such a thing as *the text*, a theoretical entity that defines the sufficient and necessary conditions of textuality, with no regard for practice, history, or technology. (There are also the problems of translation, transcript, pastiche, theft, censorship, editing, variorum editions, incomplete manuscripts, and oral narratives, which will not be discussed here.)

One of the most important ideological aspects of the effects on verbal communication of the present and earlier information technologies is that the transcendental concept

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of text seems to survive. It does not come to mean something else, like “electronic book,” “computer novel,” or “virtual document”: the electronic text, for all its hype and naiveté, is still a text. If we accept this claim, then it seems clear that textuality cannot be defined in terms of location, anatomy, or temporality. What is the difference, in terms of script, between *Don Quixote* on paper and *Don Quixote* on a screen? I believe they are the same, although I “know” that the ink-cellulose relationship promotes and impedes different rituals of use than does the electron-phosphor relationship.

To clarify the fundamental mechanisms of texts, we should study text as information. This simple and perhaps anticlimactic injunction does not leave the eternal questions of rhetoric and poetics in the hands of the information theorists any more than the fundamental problems of semantics can be solved by phoneticians, but it might give us a more stable object to work with in a time when our old paper-based paradigms seem to disperse on the winds of the rhetoric of the new technologies. Under these circumstances it might seem a suspect move to link our concept of textuality to the very scientific ideology that causes our crisis, the theories of cybernetics and information as conceived by Norbert Wiener, Claude Shannon, and others in the 1940s.² However, this is hardly a controversial connection in itself, for the influence of this paradigm on literary theory can be found throughout structuralism and beyond, in the hegemonic works of Roman Jakobson and Umberto Eco, for example. Where this new adaptation might prove to be a radical departure is in the way we shall use it to define textuality independent of its traditional associates, the reader/receiver/audience and writer/sender/author. This move, which might be seen as self-defense, serves two practical purposes: to avoid the rather silly idea that the reader and author are becoming the same person; and to free the text from being identified with its readings and its writings. A text is not what we may read out of it, nor is it identical with what someone once wrote into it. It is something more, a potential that can be realized only partially and only through its script. Furthermore, texts (whether they exist or not), like electrons, can never be experienced directly, only by the signs of their behavior. Texts are cross products between a set of matrices—linguistic (the script), technological (the mechanical conditions), and historical (the socio-political context); and because of the temporal instability of all of these variables, texts are

processes impossible to terminate and reduce. This perspective lets us include nonlinear texts, many of which have no author (or even reader) in the traditional sense.

After the tensions and misunderstandings caused by the intrusions of new computer-mediated textualities and the inevitable resistance to them have been absorbed into literary theory, new textual paradigms will eventually emerge. They will no doubt be very different from the perspective presented here, but with a little luck their metaphysics might be informed by the principles behind the lines of the textual technologies, as well as by the metaphors of the latest interfaces.

A Typology of Nonlinear Textuality

The use of the term *nonlinearity* in this essay is grounded in mathematics and not inspired by the modern physical sciences. I emphasize this point not because I want to distance myself from the claims of literary critics, like Katherine Hayles, who employ the term in its latter sense, but because the influence of nonlinear dynamics on recent literary theory should not be confused with the present formal concept of nonlinear textuality.³ Insights promoted by the metaphors of nonlinear physics aid understanding of nonlinear texts as well as linear ones, but reading a nonlinear text is not the same as a reading informed by research in fractal geometry or chaos theory. The behavior of some kinds of nonlinear texts can certainly be described in terms of unpredictability, self-organization, and turbulence, but for the definition and basic understanding of nonlinear literature we need not look that far.

For a formal definition of our concept, the mathematical branch of topology will suffice. According to my copy of *Webster's New Twentieth-Century Dictionary*, this is the theory of “those properties of geometric figures that remain unchanged even when under distortion, so long as no surfaces are torn.” Without too much discordance, I hope, the textonomical version of topology may be described as “the study of the ways in which the various sections of a text are connected, disregarding the physical properties of the channel (paper, stone, electromagnetic, and so on), by means of which the text is transmitted.” The original mathematical meaning is transposed from geometry to textonomy rather than metaphorized, because the formalism is left intact. Textual topology describes the formal structures that govern the sequence and accessibility of the script, whether the

process is conducted manually (for example, by convention) or mechanically (for example, by computer).

If texts are to be described in topological terms, they must be shown to consist of a set of smaller units and the connections between them. Further, the function of these units must be relevant to our notion of nonlinearity. It is not difficult to partition any text into graphemes (letters), lexemes (words), or syntagms (phrases or sentences), but none of these elements indicates nonlinearity by its presence. As later examples reveal, the position of a single letter or the position of many syntagms strung together can make a text nonlinear. Therefore, the unit for which we are looking is clearly not defined by linguistic form. This unit, which is best conceived as an arbitrarily long string of graphemes, is identified by its relation to the other units as constrained and separated by the conventions or mechanisms of their mother text. It should be noted that these textual units usually do not upset the laws of grammatical language, but that is of no importance to our definition.

As a suitable name for such a unit I suggest *texton*, which denotes a basic element of textuality. In accordance with the concept of textuality developed in the previous section, a more logical name might seem to be *scripton*, but this term posits that the textual unit belongs to the reading process rather than that it inheres in the textual structure as a strategic potential. A scripton, then, is an unbroken sequence of one or more textons as they are projected by the text. Another alternative to *texton* might be *lexie*, after Roland Barthes's "*unités de lecture*" ("units of reading") in *S/Z*.⁴ This candidate, adopted by George P. Landow (1992) from an English translation as "lexia," I want to avoid because of Barthes's emphasis on seriality ("*fragments contigu*") and the destructive process of its separation ("*découpe*") from the text.⁵ For Barthes, lexies are not the building blocks of textuality but a violent and powerful demonstration of "reading." In sharp contrast to the playful combinatorics of textual nonlinearity, Barthes's motto is clearly *divide et impera*.

In addition to its textons, a text consists of one or more *traversal functions*, the conventions and mechanisms that combine and project textons as scriptons to the *user* (or reader) of the text. We use these functions to distinguish between the variants in our textual typology. A traversal function might be a simple act of accessing a text (for example "pick a random card" or "Ecc 12:12b") or it might be

a complex set of instructions (for example a computer program such as *Eliza*) that compiles a scripton from textons. Since there is an infinite set of traversal functions, I shall not try to make an inventory of them here but instead describe a set of basic variates that together defines a multidimensional coordinate system into which the functions can be plotted. This proposed matrix, which is clearly incomplete, may be expanded or changed as new traversal functions are discovered, or as existing ones are better understood. The categories I intend to extract are pragmatic and tentative, and will hopefully yield to a more concise model as the research progresses.

Below is a list of the variates, slightly adapted from my *Texts of Change*, in which they are developed and discussed at length and applied to a set of nonlinear texts.⁶ Then, by the exploratory data-analysis method known as correspondence analysis, a two-dimensional plot was produced in which the texts formed groups that provided a basis for general classification.⁷

Topology. The fundamental difference is that between the *linear* and the *nonlinear*. A nonlinear text is a work that does not present its scriptons in one fixed sequence, whether temporal or spatial. Instead, through cybernetic agency (the user[s], the text, or both), an arbitrary sequence emerges.

Dynamics. Then there is the difference between the *static* and the *dynamic* text. In a static text the scriptons are constant, whereas in a dynamic text the contents of scriptons may change while the number of textons remains fixed (*intratextonic* dynamics), or the number of textons may vary as well (*textonic* dynamics).

Determinability concerns the stability of the traversal function; a text is *determinate* if the adjacent scriptons of every scripton are always the same, and *indeterminate* if not.

Transiency. If the mere passing of the user's time causes scriptons to appear, it is *transient*, if not, it is *intransient*. If the transiency has the nature of "real time" it is *synchronous*; if the relationship between the user's time and the passing of fictional time is arbitrary, we call it *asynchronous*.

Maneuverability. The question of how easy it is to access the scriptons of a text can be described in terms of traversal functions and their combinations. The most open (or weak) we call *random access to all scriptons*; then there is the standard hypertext traversal function—the *link*, *explicit access to all scriptons*; the *hidden link*; the *conditional* or *complex link*; and, finally, the arbitrary or *completely controlled access*.

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User-functionality. Besides the *interpretative function* of the user, which of course is present in the use of both linear and nonlinear textuality, the use of nonlinear texts may be described in terms of four active feedback functions: the *explorative function*, in which the user decides which “path” to take; the *role-playing function*, in which the user assumes strategic responsibility for a “character” in a “world” described by the text; the *configurative function*, in which textons and/or traversal functions are in part chosen and/or designed by the user; and the *poetic function*, in which the user’s actions, dialogue, or design are aesthetically motivated.

Any type of text can be discussed according to these categories; I avoid the primitive and theoretically uninteresting division between electronic and hard copy texts as well as the nebulous concept of interactive fiction. The model is equally applicable to a child’s interrogation of a storyteller and a researcher’s conversation with an artificial intelligence program, or a radio broadcast of *The Wind in the Willows*.

The best way to test a model is to see how well it stands up to new data. Since I developed mine in 1991, a new text type has appeared, invented by the science fiction author William Gibson. His *Agrippa: A Book of the Dead* (1992) displays its script at a fixed scrolling pace on the screen and then encrypts it by a technique cryptically known as RSA, rendering it effectively unreadable after that one projection.⁸ Leaving the more obvious jokes aside (better make reservations down at the library, quick!), this is clearly one more of those one-of-a-kind texts for which “the medium is the message” seems to have been intended. But that should not stop the empirical literary critic. I must admit to a curious feeling of unease here. *Agrippa* perversely obeys the logic of cultural capitalism beyond the wildest dreams of publishers: it is the non-reusable book. At the same time it obviously subverts the metaphysics of textual mass production. How? By being a copy that destroys its text, or a text which destroys its copy? *Agrippa* is a unique lesson in textual ontology, a linear text that seems to flirt with nonlinearity, not through its convention or mechanism but through the difference between its used and unused copies. The individual copy-as-text is linear, because there is only one sequence: first, the decrypted scripton once, then the re-encrypted one for ever after; but the text-as-copy may turn out to be either of the scriptons and is therefore nonlinear. Rather than accept that this paradoxical result undermines

my linear-nonlinear distinction, I contend that by destroying its traversal function it exposes the inherent instability of the metaphysical concept of “the text itself.” Thus, *Agrippa* becomes nonlinear only if we choose to accept the “text-behind-the-text” as more real than the physical object that can refuse to be read. As for the rest of our categories, *Agrippa* is a rather unusual combination of a static, determinate, and transient text with completely controlled access to scriptons.

As a simplified synthesis of this model I now propose four pragmatic categories, or degrees, of nonlinearity: (1) the simple nonlinear text, whose textons are totally static, open and explorable by the user; (2) the discontinuous nonlinear text, or hypertext, which may be traversed by “jumps” (explicit links) between textons; (3) the determinate “cybertext,” in which the behavior of textons is predictable but conditional and with the element of role-playing; and (4) the indeterminate cybertext in which textons are dynamic and unpredictable. The weakness of this simplified model is that some nonlinear texts, such as those that are both static and indeterminate, fall between the generalized categories. However, it is not uncommon in cultural theory that generalization means loss of precision, and it should always be weighed against the usefulness and convenience of the simplification and the fact that a more rigorous and unmitigated model exists.

The rest of this essay discusses each of these four categories, some of the texts that can be said to belong to them, their attributes and peculiarities, and their importance to literary theories and to the practice of literary criticism.

The Readerless Text

Nonlinearity can be achieved in many ways, the simplest of which is a script forking out in two directions on a surface, forcing its witness (the user) to choose one path in preference to another. In such a case (for example, the “dream maps” in Kathy Acker’s *Blood and Guts in High School*), the user can immediately afterwards take the other path and thus eventually view all parts of the script simultaneously.⁹ The verbal oscillation created by two equally possible combinations, the choice of which is entirely up to the user, produces an ambiguity different from the usual poetic double meaning of a word or phrase, because there seem to be two different versions, neither of which can exist alongside the other, and both obviously different from the text itself. Like

optical illusions, we can imagine first one, then the other, but not both at the same time. When we look at the whole of such a nonlinear text, we cannot read it; and when we read it, we cannot see the whole text. Something has come between us and the text, and that is ourselves, trying to read. This self-consciousness forces us to take responsibility for what we read and to accept that it can never be the text itself. The text, far from yielding its riches to our critical gaze, appears to seduce us, but it remains immaculate, recedes, and we are left with our partial and impure thoughts, like unworthy pilgrims beseeching an absent deity.

However, if a text cannot be conquered, it is all the better suited for worship. The wall-inscriptions of the temples in ancient Egypt were often connected two-dimensionally (on one wall) or three-dimensionally (from wall to wall and from room to room), and this layout allowed a nonlinear arrangement of the religious text in accordance with the symbolic architectural layout of the temple.¹⁰

Without doubt, the most prominent and popular nonlinear text in history must be the famous Chinese work of oracular wisdom, *I Ching* or *Book of Changes*, one of the great classics of antiquity, which was used for thousands of years for meditation and as an oracle. It is not, as is sometimes stated, the oldest text in Chinese and world literary history, but it is well over three thousand years old and originates from the symbol system said to have been invented over five thousand years ago by the legendary Fu Hsi.¹¹ Other notables, among them King Wen, the Duke of Chou, and Confucius, have developed and annotated the text down through the ages; and the text is still being rewritten and mutating, adapting to modern society and its paradigms.¹²

I Ching is made up of sixty-four symbols or hexagrams, which are the binary combinations of six whole or broken (“changing”) lines (64 = 2⁶). A hexagram (such as nr. 49: ☰/☷ *Ko/Revolution*) contains a main texton and six small ones, one for each line. By manipulating three coins or forty-nine yarrow stalks according to a randomizing principle, textons from two hexagrams are combined, producing one out of 4096 possible scriptons. This scripton contains the answer to a question the user wrote down in advance. The extremely clever openness of the formulations, the sense of ritual involved in throwing the coins or stalks, and the strangely personal communication between the user and the book almost always make an answer extracted from *I Ching* seem relevant and sometimes even divinely inspired.

Unlike historic texts with a fixed expression, such as *Beowulf*, *I Ching* seems to speak uniquely to us across the millennia, not as a distant mirror that can be understood in a philological or romantic sense but as an entity that somehow understands us and exists for us. This almost religious effect can be partly explained by the repeated updates and the fact that the text was intended to be useful and directly relevant to events in people’s lives, but it seems to me that it is the explicit and elaborate ritual, largely unchanged through the ages, that creates the textual *presence* that allows us to be naive users—not readers but agents of the text, closely related to the users of three thousand years ago, despite the epistemological interventions of time and culture. *The Book of Changes* may not be the world’s first text, but it is certainly the first expert system based on the principles of binary computing that very much later became automated by electricity and the vacuum tube.

Both types of text discussed so far seem to reject the presence of the traditional reader figure, as it is implied and applied in the theories of literature. As an individual, this pale and uncontroversial character never mattered much to us critics anyway, and then only as a construct on which to hang the baser pleasures of the text; he is our poor and predictable cousin, slave to the rhythm, lost in the textual pleasure dome like the ball in a pinball machine. Later, for the reader-response theorists, he became a thumbtack with which to pin down the variable of literary meaning when it could no longer be located in the text. Active or passive, the reader is always portrayed as a receiver of the text, going quietly about the business of consuming, constructing *meaning only*, a fixed but evolving character at the end of the text’s production line, defined by the conventions and strategies of reading. Of course, it can be argued that this relationship is no different for nonlinear texts, once the shock of an alien form is gone and the particular convention is understood and mastered. This counterpoint, which may be called the *Verfremdung*-argument, has much merit, but it ignores the fact that the understanding (beyond trivial) of a nonlinear text can never be a consummate understanding, because the realization of its script (and not just its meaning) belongs to the individual user, who is acutely aware of his or her own constructive participation. Since the object is unstable both in a syntactic and semantic sense, it cannot be read, only glimpsed and guessed at. Much of the initial discomfort felt by the user of a nonlinear text is caused by its

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not behaving as a real text should; once the strangeness is gone, the user knows what to expect, which is not to expect everything. The users learn to accept their position as agents of the text, sometimes happily, as in the case of the *Book of Changes*, and sometimes unhappily, as with the forking directions texts. The difference between these two types of experience can be explained by the presence or absence of an established (meaningful) ritual, which must absolve the user from the burden of reading, which in the case of nonlinearity may be defined as the frustrating attempt to harmonize contradictory scriptons from the same text. The user of *I Ching* relates the scripton directly to his or her individual situation, and the interpretation, following the ritual of producing the hexagram, can only be done by the individual.

This fall from readership should not be confused with the clever destabilization effects of so-called metafiction, in which the opposite point—readership confirmed—is made. Even (and especially) the famously “unreadable” texts subversively observe the metaphysics of the general reader: the door would not be locked if the owner did not believe in thieves.

Few texts drive home the point of the readerless text more abundantly than Raymond Queneau’s *Cent Mille Millions de Poèmes* (1961).¹³ In this short book, ten pages are cut into fourteen one-line strips, and the user is invited to flip the strips individually, to form 100,000,000,000,000 different combinations. As it turns out, each of the 140 strips (or textons) is a sonnet line, and the result of any combination is a scripton in the form of a formally perfect sonnet. Here is sonnet number 65 957 658 052 316:

Quand l’un aveque l’autre aussitôt sympathise
que convoitait c’est sûr une horde descrocs
des êtres indécis vous parlent sans franchise
il ne trouve aussi sec qu’un sac de vieux fayots

L’un et l’autre a raison non la foule insoumise
qui clochard devenant jetait ses oripeaux
aller à la grand ville est bien une entreprise
l’enfant pur aux yeux bleus aime les berlingots

Du pôle à Rosario fait une belle trotte
on giffle le marmot qui plonge sa menotte
lorsqu’on revient au port en essayant un grain

Ne fallait pas si loin agiter ses breloques
on transports et le marbre et débris et défroques
la gémellité vraie accuse son destin.

This may not be the most exciting of lyrical poetry, but it is unique in a very special sense: I have never read it before, and chances are that neither has anybody else. Who wrote it? Was it me, or Queneau (and if so, in 1961 or 1992?), or perhaps the text itself? Will anybody ever read number 65 957 658 052 316? For one person to read all the sonnets is clearly impossible, and even a very small fraction—say ten million—would take at least one hundred years. *Cent Mille Millions de Poèmes* effectively mocks the theoretical notions of writer and reader, while the power of the text is cleverly demonstrated. (What it does to our notion of the sonnet is perhaps better left unsaid.) “Obviously the possibilities of the book as format are being strained to the limit,” comments William Paulson, who goes on to propose *Poèmes* as “an ideal candidate for a computerized version.”¹⁴ Contrary to Paulson, I suggest that the fact that it is a book is just as significant; and if it seems easy to implement as a computer program, that is because of the simple and unstrained elegance of its idea.

The difference between these experiences and my experience with Boorman’s *Zardoz* is that in the latter case I could, based on my cultural competence, deduce the actual existence of a version that was independent of me and the possibility of a proper reading that could be conducted by an easily imagined proper reader, but not by me. In other words, I rejected my reading because it told me that I was not a real reader, since what I was reading was not the real text. The shock of discovering that one is not a reader can only happen (and only accidentally) with a linear text, because that is the only text in which the metaphysics of a real reader has any credibility and the only text in which the reader can exist as a reducible, accountable figure. In addition, *reader* has—until now—always been defined by literary theorists with only the linear text in mind. If we want to know what is going on between nonlinear texts and their users, we must come up with a concept that implies both more and less than reading and redefines literary satisfaction as well as hermeneutic behavior.

Hypertext Is Not What You (May) Think

Hypertext, for all its packaging and theories, is an amazingly simple concept. It is merely a direct connection from one position in a text to another. However, when we speak of hypertext, it can signify at least three different things: (1) the general concept, as outlined above; (2) an implementation of

the concept, usually a computer application called a hypertext system, with idiosyncrasies and enhancements that make it different from other systems; and (3) a text embedded in (and defined by) such a system. As an unfortunate result, many assumptions made about the general concept of hypertext are really about a specific implementation. Added to that are the political conjectures about the benevolent effects on the structures of power between writers and readers, teachers and students, government and the public, in which the good guys seem to be winning, at least in theory. Only the first of these relationships will be discussed here, and only because of the assumptions about the effects of hypertext upon the figures of author and reader.¹⁵ (Of course, implicit in the term *hypertext* is a sphere of meanings beyond the operational. Those who would play on this potential cannot completely escape its dark side: the excessive, the abnormal, the sickly.)

Although the term *hypertext* was first used by Theodor H. Nelson in 1965 (compare Nelson 1987), the modern origin of the idea is generally accepted to stem from Vannevar Bush, whose article “As We May Think” (1945) described a possible solution to the scientist’s problem of keeping up with the “growing mountain of research,” in the form of a “sort of mechanized private file and library,” a machine for storing, annotating, retrieving, and linking information: the *memex*.¹⁶ Although Bush emphasizes the “trail”—the linear ordering of interesting items from the “maze of materials available”—he allows his user to go off on little side excursions. Bush was no techno-pessimist (at the end of the article he even envisions the neural jack of the 1980s cyberpunk science fiction!), and we can hardly blame him for not coming up with a complete “web view” on hypertextuality in 1945. But it should be pointed out that in his fascinating vision—his *poetics*—nonlinearity is as much a problem (the “maze”) as a solution (the “trail”). Where he clearly concurs with his apostles is in his focus on user-created links and annotations. This may seem more radical than it actually is, with subversive political consequences for the world of literature and art; but Bush’s user is clearly modeled on the traditional academic author, who can carry out his critical comparisons and annotations of sources with the same serene distance as before, only much more efficiently.

The principle of hypertext should not be linked to a particular ideology or poetics because it can be used (and of

course misused) by many. Moreover, when as literary critics we examine a hypertextual text, we should take care not to confuse its interpretation with the author-reader relationship made possible by the ideology of its hypertext system and then assign the conclusions to a general theory of literary hypertext.

Hypertext theorists frequently employ spatial imagery to describe the relations made possible by links and textons: maps, three-dimensionality, textual landscapes, navigation, topography, and the like. This rhetoric fails to hide the fact that the main feature of hypertext is discontinuity—the jump—the sudden displacement of the user’s position in the text. Pure hypertext is actually among the least topographical modes of nonlinearity. To ease this situation, hypertext systems often introduce additional features: overviews, index views, web views, texton lists, and so on. Some would undoubtedly argue that these instruments are also hypertext, but since we would recognize a text as hypertext without any of them, we should also endeavor to discuss the literary ramifications of hypertext without them. When they are included in a literary hypertext, they substantially affect the textual ritual, usually to a point at which it is difficult to speak about the same text.

A text that already has become canonical in the discussions of literary hypertext is Michael Joyce’s *Afternoon, a story*.¹⁷ Comprising (according to the information supplied at startup) 539 textons and 950 links, *Afternoon* both celebrates and subverts hypertext structure. The first of its kind, it intriguingly demonstrates the potential of hypertextuality for literary experiment and explores the effects of nonlinearity on narration.

There are no visible links in *Afternoon*, and the user may click on any word in the scriptons to see if they yield (link to) something special. If they do not, or the user presses the return key, the next default scripton in the present chain occupies the screen. In addition, the user may call up a menu with explicit links, but this can be a disruptive element in the otherwise suggestive and enigmatic ride on the link stream. To complicate matters, some links are conditional; they are available only if the user has earlier traversed certain unspecified scriptons. As anyone familiar with hypertext programs knows, this interface is very unusual: an invisible link is as unheard of as a newspaper article without a headline. The conditional link is just as uncanny and makes

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the text “seem to have a mind of its own.”¹⁸ Thus *Afternoon*, arguably the first literary hypertext, turns out to be something more: a cybertext disguised in hypertext’s clothing.

It is hard to classify *Afternoon* as a narrative (or “a story,” as the text paradoxically titles itself). Although within most of the individual scriptons the voice of a first person narrator relates events to a narratee in a traditional manner, the unpredictable changing of scenes (as one trail of related scriptons abruptly stops and another begins) constantly undermines the would-be reader’s attempt to identify with the narratee, as well as the identification of the narrator and the (implied) author or exo-narrator, as it were. In *Afternoon* there seems to be an anti-narrator at work, giving the narrator (and me) a hard time. In linear experimental texts the subversive effect is sometimes achieved by a “distance between narrator and narratee” and sometimes by the “loss of narratee”—the narrator as solipsist.¹⁹ In *Afternoon*, however, the relation between narrator and narratee appears relatively normal; while the distance between the user and narratee on one side and narrator and author on the other is stretched to the limit by the unreliable links. Far from feeling like Landow’s “reader-author” (117), who has no problem constructing “meaning and narrative from fragments provided by someone else,” I felt constantly sidetracked, turning and turning in the dilating text, dead sure that important things were being whispered just beyond my hearing. I cannot deny that it was a very fascinating literary experience.

It can be argued that the text I encountered was (in more than one sense) not the same as the one discussed by Stuart Moulthrop, J. David Bolter, and Landow. From their accounts it appears that they used a different and more advanced version of *Afternoon*’s hypertext system, the “author version” of Storyspace, which allows writing and adding links, and most significantly contains a global view, a graphical representation of the topological relations between all textons and links. My version was in Readingspace, the stand-alone reader program that *Afternoon*’s publisher distributes. Consequently, my encounter, “one scripton at a time,” with *Afternoon* was very different from theirs; for the global view, even if they did not use it, gave them a safety net that I lacked. While I was lost in the labyrinth, they could be “up there” with its creator—but only up to a point. Whatever changes they might impose, it would only be on their own copies; Joyce’s text

would stand unchanged. In this, hypertext is not different from paper-based linear texts. The balance of power between readers and writers is not changed by hypertext alone, nor by its enhancements, but by the political and economic logic of society (to use some slightly inaccurate clichés). This may change, under the influence of technological change and other things; but until it does, hypertext is just one more “instrument in some representational enterprise,” to borrow a phrase from Samuel Delany.

To expand the notion of hypertext by subsuming other computer-mediated textual communication phenomena such as Usenet (see Bolter, 29) or intertextual allusion (see Landow, 10) will only render the concept useless for critical discourse. Landow’s term “implicit hypertext” implies that an allusion and a link are essentially the same, but we only need a hypertext with both links and allusions to see that they work differently and must be considered two separate literary instruments. Bolter, eager to proclaim the end of “the printed book,” plays along with the metaphysics of logocentrism and reduces print on paper to barely a corner of its multiform nature: “A printed book generally speaks with a single voice and assumes a consistent character, a persona, before its audience.”²⁰ For “the electronic text,” however, this no longer applies, because “it is not a physical artifact.” To go against Bolter’s rhetoric, I would say that instead of having two sets of opposed attributes, one connected to the “printed” and one to the “electronic” text, we have a number of different text types, some paper based and some digital, with the greater variety among the digital ones, and the paper based most centrally placed. Thus, there may be more difference between two digital texts than between either of those and a paper text. Allusion, reference, quotation, and linking are all *different* functions of intertextuality, just as Usenet newsgroups, electronic mailing lists, hypertext systems, paperback bestsellers, and flysheets represent different modes of textuality.

As the analysis of *Afternoon* indicates, literary hypertexts seem to pose interesting perspectives for students of literature. The question of nonlinear narrative versus anti-narrative should not be decided by the evidence from only one text (even if it exists in two versions), and perhaps we need a new terminology that lets us name the representation and composition principle that relates to nonlinearity as narrative relates to linearity.

However, one traditional term seems almost perfect to describe literary hypertexts. *Afternoon* does not represent a break with the *novel*. On the contrary, it finds its place in a long tradition of experimental literature in which one of the main strategies is to subvert and resist narrative. The novel (“the new”), from Cervantes to the *Roman Nouveau*, has always been an anti-genre, and *Afternoon* is but its latest confirmation.

Death and Cybernetics in the Ever-ending Text

I'm not sure that I have a story. And if I do, I'm not sure that everything isn't my story.

—Michael Joyce, *Afternoon, a story*

If literary hypertext is a new form of computer-mediated textuality, cybertext is a fairly old one, going back to the 1960s if not longer. *Cyber* is derived from *cybernetics*, the name of Norbert Wiener's science of “control and communication in the animal and the machine,” again derived from the Greek *kybernētēs*, *steersman* (compare governor). A cybertext is a self-changing text, in which scriptons and traversal functions are controlled by an immanent cybernetic agent, either mechanical or human. There are many species of cybertext, and my distinction between determinate and indeterminate tries to set up an important division between two main groups: those that can be predicted (for example, one set of user actions will always yield the same set of scriptons) and those that cannot. The second group will be discussed in the next section.

The history of computer-mediated cybertexts can be traced to two different sources, both originating from fields of computer science, and both with their memorable ur-texts. The first, *Eliza*, created by Joseph Weizenbaum in 1966, was an early success in the field called artificial intelligence. The mother of all dialogue programs (*Parry*, *SHRDLU*, *Racter*, and countless others), *Eliza* played the part of a psychotherapist, asking the user questions and constructing further questions using information from the answers. Usually, dialogues turned rather Pinteresque as soon as the users discovered *Eliza's* very mechanical nature; but Weizenbaum's invention effectively demonstrated man's needs for communication, no matter with whom (or indeed *what*), and an important literary genre—the artificial conversationalist—was born.

The other source is known as the classic game *Adventure*, the first of the highly popular computer game genre of adventure games. According to Jon Lanestedt, *Adventure* was first a landscape simulation of Colossal Cave in Kentucky, topographed as a Fortran program by William Crowther at the end of the 1960s, then enhanced by Don Woods to attain its adventure form, and later modified and ported by others to countless computer platforms as the home-computer explosion started at the end of the 1970s.²¹ Its technical structure became the paradigm for a very large number of similar games, even after more advanced types, such as Infocom's *Zork*, became commercially available.

The basic structure of *Adventure* can be described not as a topography but as an *ergography*, the textually represented laborious progress of the main character/narratee/user; the text's “you.” *You's* task is to find all the treasure and kill the appropriate monsters while avoiding getting killed or stuck or lost in the topographical maze. The user controls *you* by typing commands, such as “kill troll,” or “grab gold,” that are interpreted by a simple verb-object parser. Directions can be specified by simple letters: “n” for “north,” “d” for “down” etc. Depending on the user's input, the text will issue short scriptons describing the landscape, possible exits to the next room, any objects lying about, or the result of the user's last command. Here is a short sample of the start of a session with *Adventure* (my commands are in capital letters):

Welcome to Adventure!! Would you like instructions?

N

Please answer the question!

NO

You are standing at the end of a road before a small brick building. Around you is a forest. A small stream flows out of the building and down a gully.

BUILDING

You are inside a building, a well house for a large spring.

There are some keys on the ground here.

There is a shiny brass lamp nearby.

There is food here.

There is a bottle of water here.

TAKE KEYS

Ok.

...

LEAVE

You are at end of road again.

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DOWN

You are in a valley in the forest beside a stream
tumbling along a rocky bed.

DOWN

At your feet all the water of the stream splashes into a
2-inch slit in the rock. Downstream the streambed is
bare rock.

DOWNSTREAM

You don't fit through a two-inch slit!
You're at slit in streambed.

Adventure and most texts like it are determinate, intransient, and intratextually dynamic, with completely controlled access to scriptons. The user's function takes the form of role-playing, since the user assumes strategic responsibility for the narratee. As with *Afternoon*, these texts often give me a feeling of being lost, the feeling that the real action is taking place elsewhere in the text; but in adventure games the ennui is usually replaced by death, when the *you* has reached a dead end in the topography or invoked some deadly response by a wrong action. Death in the cybertext is a strange kind of death, however, in relation to death both in fiction and in real life. Rather than signifying closure—the end—“cyberdeath” signifies a sort of reincarnation of the main character: death implies beginning. This phenomenon most clearly establishes the difference between main character, narratee, and user. The main character is simply dead, erased, and must begin again. The narratee, on the other hand, is explicitly told what happened, usually in a sarcastic manner, and offered the chance to start anew. The user, aware of all this in a way denied to the narratee, learns from the mistakes and previous experience and is able to play a different game.

Just as death in the determinate cybertext is a kind of unend, the end of the cybertext is a kind of undeath also contrary to fiction. The end of a cybertext (when the user quits) can be either successful (the user wins) or unsuccessful (the game is not solved). The first case denies the satisfaction that can be experienced at the end of a good, traditional epic, since the *you* remains in the text after completing the adventures, but there is nothing more to do. Even when the text includes some sort of ceremony of victory, it cannot provide the traditional build-up and release of tension that the readers of fiction normally expect. In Aristotelian terms, the end is marked by peripety not catharsis. If the end is unsuccessful, this too means abandonment of the *you*, which

then remains in the text as a ghost in the machine: not living, not properly buried, and with a cause left unfinished.

If the absent structure of narrative is the key problem in literary hypertext, in determinate cybertext the absent structure is the plot. Since without a user there can be no action (*praxis*) in a determinate cybertext, the concept of story (*fabula*) is meaningless. In fiction the story determines and hides behind the plot, which produces the action, whereas in cybertext the plot itself is hidden, and so the discursive causality is reversed: action determines (or seeks in vain for) the plot, which if found does not produce anything interesting, only (barely) closure. Although there is a narrator, because of the narratee's significant interruptions there can be no narrative, only narration. The goal of this dialogue is to try out possible plots until the shoe fits: the user is playing for the plot.

Anthony Niesz and Norman Holland, in their early article on what they called “interactive fiction” (a concept that corresponds to determinate cybertext, if one disregards their definition of it), contend that “Interactive fiction has become possible only with the advent of high-speed digital computers that are capable of handling words.”²² However, when they compare computer-based adventure games to paper-based ones, the only difference they can find is that the latter do “not yield the sense of true dialogue that one gets from computerized interactive fiction.” What they mean is that the user does not type words on the screen and watch the response. (The “sense of true dialogue” is hard to take seriously.) In fact, a game book such as *The Money Spider* (of the type that instructs, “If you want to hear about Schmidt, turn to 270, and if you want to hear about Popper, turn to 90”) tells the user to write on its pages to map progress.²³ When classified by the categories of the variate model, *The Money Spider*, just like *Adventure*, is determinate, intransient, and intratextually dynamic (since the user by writing changes at least one texton), with completely controlled access to scriptons (it is possible to cheat, of course, but that can be done in *Afternoon* too). This is no coincidence, because the game book genre was in part inspired by and adapted from the computer-mediated adventure game: an interesting example of how “the printed book” can subsume “the electronic text,” if the market demands it.

“The Lingo of the Cable”: Travels in Cybertextuality

As the field of artificial intelligence expanded, it soon overlapped with that of topography and world simulation and produced story generators and models for representing actions and characters.²⁴ Later, research took an explicit interest in the adventure game, developing complex models of the interaction between a user-controlled character and artificial persons within a simulated world, for example, the Oz Project of the Simulated Realities Group at Carnegie Mellon University.²⁵ Such systems can be classified as indeterminate cybertexts, since the level of complexity and the flexibility of user input, like explicitly programmed random behavior, make scriptons unpredictable.

Interestingly, a main goal of adventure game theorists such as Brenda Laurel and others is to be able to control what they call the plot. The user-character will be allowed some leeway, but by use of Playwright, an expert system with knowledge of dramatic structure (perhaps not totally unlike an intelligent version of *Afternoon's* anti-narrator), the situations and actions would be carefully orchestrated to fit its model of appropriate drama. Although this aesthetically motivated poetics has the goal of creating well-formed dramatic unity, it is hard not to see the potential for conflict between the user and this *deus in machina*. As the history of the novel has shown, the forces of carnivalism will work centrifugally against the law of genre in any simulated social situation. At last, in the cybertext, the user can become a little akin to an author—not, I hasten to add, to the author of the cybertext (and perhaps the conception of author should not be stretched this far), but perhaps, say, to a novelist of the nineteenth century.

The early determinate texts, such as *Adventure* and *Eliza*, seemingly invited the user to participate, but soon revealed that this was impossible, and that subordination was the name of the game. The user could only fill, or more typically fail to fill the narrow track of the text's hidden “plot”; and the texts evolved to play on this failure, as testified by the often (and sometimes unintended) ironic and humorous response to the user's contra-generic activities (for example, “drop dead”—“You're not carrying that!”).

Indeterminate cybertext should be seen as a movement not against, but *beyond* genre. As the simulation of social structure becomes richer, plot control becomes increasingly difficult; and it is easy to predict the decentered cybertext in

which stories, plots, and counterplots arise “naturally” from the autonomous movements of the cybernetic constructs. Already free of narrative, this Baudrillardian nightmare—if that is what it is (compare Moulthrop, “Hypertext and ‘the Hyperreal’”)—promises many more escapes: from plot and plotters (authors and author-machines), from genre and contra-genericity, and from the social self. If it succeeds, the textual pleasure machine could be said to have escaped even from simulation and become an emulation, a “supplement” as dangerous as they come.

As always, we do not have to wait for the textual machines to catch up. They already have. The telegraph, “the singing wire,” is a conspicuously unsung hero in most histories of communication.²⁶ Invented in 1793 by Claude Chappe, the first modern telegraph was optical, not electric, implemented as a chain of semaphore towers in France. Later the American Samuel Morse constructed his electromagnetic telegraph, and in 1844 set up a line between Baltimore and Washington, thus redefining the meaning of the word communication. A reason for media theorists' omission of the telegraph could be that it is categorically unclear, depending equally on material and immaterial technologies, and therefore an embarrassment to the great divide between print and electronic media.

From the start, the electric telegraph was used for textual fun and games. Marshall McLuhan tells this story: “When a group of Oxford undergraduates heard that Rudyard Kipling received ten shillings for every word he wrote, they sent him ten shillings by telegram during their meeting: ‘Please send us one of your very best words.’ Back came the word a few minutes later: ‘Thanks.’”²⁷

This is not the place to retrace the fundamental changes to society, time, and space brought about by the telegraph, but it should be noted that telegraph and later the telex was *the* method of instant global textual communication during a period of more than a hundred years, before digital computer networks came into being in the 1960s and '70s. However, with the computer's ability to handle more than two communicators simultaneously, new types of nonlocal textual fora were made possible. First there were the mainframe computers with their user communities sending messages to each other and so forth, then communication between computers (and their users) over a distance, by telephone wire or dedicated cable networks. With the emergence of the networks and the use of modems, many different kinds of

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textual communication evolved, from e-mail via mailing lists and newsgroups to so-called on-line chat, such as the interesting phenomenon Internet Relay Chat.²⁸

At the end of the 1970s, with the spread of the highly popular *Adventure* over the networks, it was to be expected that someone should combine instant textual communication and adventure gaming. In the fall of 1979 at Essex University, Roy Trubshaw started the development of the Multi-User Dungeon (MUD) on a DEC System-10 mainframe, a task taken over by Richard Bartle in the summer of 1980.²⁹ The first MUD was a successful game, with users scoring points by killing each others' characters or finding hidden treasures and eventually reaching the powerful status of wizard, but it was also much more than a game; it was a cyberplace where people could enjoy complete anonymity and freedom from their social and physical selves and take on any persona they could think of, doing things with words that they would normally never do. Thus a new mode of textual expression was initiated, different even from the telegraph: the user had to be very quick, and formulate short, unretractable sentences in seconds, or die. Dorothy Parker and Ernest Hemingway would have loved it.

Like *Adventure* before it, MUD spread out globally on the academic computer networks, was soon copied, and changed into other types of multi-user texts. In the summer of 1989 at Carnegie Mellon University, James Aspnes programmed a MUD with a significant new feature: in addition to creating their own characters, the users were allowed to expand the MUD's textual descriptions, adding their own landscapes to the topography of the MUD. This MUD, known as *TinyMUD* and reachable from any computer linked to the global Internet, emphasized social interaction and building. There was no merit system; if your character was killed, it simply got an insurance fee of 50 pennies. The co-creativity of the users was a very anarchic step from the first MUDs. *TinyMUD* lasted from August 19, 1989, to April 28, 1990, when its data base of descriptions became too big to handle, filled up by more than 132,000 user-defined objects, each of which could contain several textons.

When regarded as literary objects, MUDs seem to defy every concept of literary theory. Every user has a different (or several different) and partial perspective(s), and the users bombard each other with textons meant only to last as long as they are not scrolled off the screen. MUDs are like constantly meandering rivers, developing new courses that

cross and re-cross each other and are filled with all sorts of peculiar flotsam and jetsam. And suddenly, in the middle of chaos, a group of characters may start singing in unison the Yoyodyne song from Thomas Pynchon's *The Crying of Lot 49*: "High above the LA freeways, / And the traffic's whine, / Stands the well-known Galactonics / Branch of Yoyodyne."³⁰ Strange things happen at sea.

Compared to a nineteenth-century novel, *TinyMUD* appears totally different: transient, dynamic, indeterminate, with explorative, role-playing, configurative, and poetic user-functionality. And yet, this is literature: letters, words, and sentences are selected, arranged and disseminated to delight, impress, or enrage an unknown audience. The scriptons, which can be funny, poignant, sleazy, silly, obnoxious, or noisy, usually come in a heterogeneous mix. With more than twenty characters in the same room, it takes a hardened "MUDder" to keep track of what is going on. Special-purpose MUD-client programs that have been developed to run on the user's local machine and ease communication provide functionality that is not part of the MUD itself, such as filtering out noisy characters and automating often-used commands. Not all characters one meets on a MUD have real persons behind them, and several characters might be played by the same person. An early automatic character (so-called bot) on *TinyMUD* was called Terminator, had its own office, and was, like its cinematic namesake, programmed to kill. If you paid it 200 pennies it would go and pester any character you specified. Bots were simply external programs built using various artificial intelligence techniques and logged on by their creators to *TinyMUD* just like human players, but usually recognized by their somewhat poor communication skills.

A discussion of MUDs in terms of authors and readers is irrelevant: a MUD cannot be read, only experienced from the very narrow perspective of one or more of the user's characters, with a lot of simultaneous scriptons being beyond reach; and the user cannot be sure that a particular contribution will ever be experienced by more than a few people, or, since the other characters might all be artificial persons or controlled by the same real person, by anyone at all.

The Limits of Fiction

An important issue raised by both determinate and indeterminate cybertexts is their relation to the ontological categories of textuality: fiction, nonfiction, poetry, drama, etc. In the case of cybertexts such as *Adventure* and

TinyMUD, the most obvious choice, fiction, is not obvious enough. Adventure invites a belief from the user, but this is not the same belief or suspension of disbelief that must be sustained by the user of realistic or fantastic novels. Cybertextuality has an empirical element that is not found in fiction and that necessitates an ontological category of its own, which might as well be called simulation.

In fiction the user must construct mental images that somehow correspond to the world described in the text. The user is responsible for the images, but the text is in control and can dictate changes without any deference to external logic. From the user's perspective, fictions are neither logical nor illogical. If the fiction claims that elephants are pink, then in the fiction they are, because nobody is "there" to contradict it. A fiction, then, is not about something that does not exist but about something that it is meaningless to contradict.

In *Adventure*, the responsibility for coherence is shared between the user and the text. If the you-character drops a sword in one place, leaves, and comes back, the sword is still there. In other words, there is a systematic contract between text and user, like the causal one that exists in the real world and which, unlike fictions, can be empirically tested. In *TinyMUD* the simulation of reality is even closer to the real thing, since the conversations the user's character conducts with other characters often have the signs of real conversations.

Simulations are somewhere in between reality and fiction: they are not obliged to represent reality, but they do have an empirical logic of their own, and therefore they should not be called fictions. Unlike fictions, which simply present something else, cybertexts *represent* something beyond themselves.

The Rhetoric of Nonlinearity

As we have seen, the profound challenge of nonlinear texts to the basic concepts of literary theory makes it difficult to discuss them in common literary terms. Even to the extent it is still possible, it should be done with caution; and if we can be sure of nothing else, we may be certain that contradiction will be the uninvited master trope of our discourse. But still—what kind of (literary? semiotic?) phenomenon is nonlinear textuality? Is there a name or recognized class for the device (or better, set of devices) of nonlinearity? Do some domains of literary theory lend their vocabularies more easily to its description than others? (If so, those are the ones most worthy of suspicion.) As the

advocates of hypertext enthusiastically remind us, it can be found as fiction, poetry, textbooks, encyclopedias, and so on; so nonlinearity as the superset of hypertext is clearly not a literary genre, or a type of poetic expression or discourse. This problem of classification can also be described in semiotic terms, but mainly to the effect that a text type (in our nongeneric sense) is a signification system, "an autonomous semiotic construct that has an abstract mode of existence independent of any communicative act it makes possible," which does not really answer the question.³¹ To semiotics, texts are *chains* of signs, and therefore linear by definition.³²

If we turn to rhetoric, we see that nonlinearity is clearly not a trope, since it works on the level of words, not meaning; but it could be classified as a type of figure, following Pierre Fontanier's taxonomy of tropes and figures. In the second part of his classic inventory of rhetorical figures, *Figures du Discours*, Fontanier defines "*les Figures non-Tropes*"—the figures other than tropes.³³ These he divides into several classes: construction-figures, elocution-figures, style-figures, and thought-figures, with various subclasses including inversion, apposition, ellipsis, and repetition. Among these classes we could place the figures of nonlinearity, with the following set of subclasses: *forking*, *linking/jumping*, *permutation*, *computation*, and *polygenesis*. These subclasses can be further divided, of course; and more importantly, instances from different subclasses (and from traditional ones such as repetition and topography) can combine to constitute a text type.

Compared to the textual typology presented earlier, this perspective has the advantage of connecting to a traditional concept of literary theory, the figure. In this, however, the idea of rhetoric is even farther removed from its origin as a theory of speech. But since the non-tropic figure is the concept for unusual positionings of words, it might not be totally unjustified.

In terms of the simplified hierarchy of nonlinear texts, these classes of figures belong to the following levels: forking, found in the spatially nonlinear text; linking/jumping, belonging to the stratum of hypertext; permutation, computation, and polygenesis, all found in both determinate and indeterminate cybertext. Whereas a user-created permutation is determinate (for example, Queneau's *Poèmes*), a computed permutation may be determinate or indeterminate (for example, *I Ching*). A computation may be

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determinate or contain a random function that makes it indeterminate. Polygenesis can be determinate (for example, when the user types a sentence to *Eliza*, its response can be predicted) or indeterminate (as in the MUDs). A further classification of the figures of nonlinearity, such as distinguishing between different types of forks, links, random functions, polygenetic modes, and so on, will not be undertaken here.

The Corruption of the Critic

How can literary theory attack the textualities of nonlinearity? How can we cut them up, read into them, describe them so they fit in our narratives? How can we link them to our totems and control their hidden mechanisms? Hypertext seems already well on its way into the canon. Is this a good sign? Conquests, unlike discoveries, are seldom accidental. On the other hand, there is no such thing as literary theory; there are only theories and theorists. And texts. Literary theory, more than most academic disciplines, has always been uncentered and fragmented, a widening gyre of readings and interests linked to countless philosophies, like a true Barthesian *texte scriptible*. So if hypertext should find a home, why not here?

This essay will not answer any of the big questions: What will hypertext do to the ways we think about texts? How will it resist the ways we are going to think about it, and be remembered as something other than an in-house pet, a dead tradition of literary experiment, explained and packaged from the start? How will the powerful but extremely primitive logic of the link affect our discursive methods?

If hypertext has connected well with literary studies, cybertext, a much older textual phenomenon, has gone by largely unnoticed. An article or two, a few doctoral dissertations; the lack of interest is significant, and may have several causes. One is obvious: adventure games are *games*, and that is not our department. Neither is the similarity between *I Ching*, Queneau's *Poèmes*, and *Adventure* too striking at first sight. Perhaps, also, the adventure game, for all its trivia and popular appeal, is too radical to be recognized, because it disfigures not only the reading process but also the reader. Literary critics have generally scorned prosaic texts that too openly captured their users—in which the relationship between reader and narratee became too intimate, lacking ironic distance or *Verfremdung*. Like the telegraph, such texts fall between accepted categories, in this

case between lyrical poetry and prose. *Afternoon* on the other hand, with its subversive anti-narrator, has seemingly no problem with this, and can be welcomed and configured into literature and the literary.

The key difference between *Afternoon* and cybertexts such as *Adventure* and *TinyMUD* is what the virtual reality researchers call immersion: the user's convinced sense that the artificial environment is not just a main agent with whom they can identify but surrounds the user.³⁴ In cybertextual terms we could say that the user assumes the strategic and emotional responsibility of the character, or that the distances between the positions of main character, narratee, and user have collapsed.

To the critical institution, this ontological embarrassment becomes an ethical one. How can we be critics if we can no longer read? How can reviewers of cybertexts face the fact they probably missed large numbers of scriptons? And worse, not only will we have to admit that we barely made it to first base, but in the exploration of indeterminate cybertexts we will be reviewing the results of our own strategic and creative investments.³⁵

Problems of "Textual Anthropology"

This crisis in criticism might not amount to anything terrible, but it could be used as a new departure for literary hermeneutics. After the celebrated deaths of the author, the work, and reading, the text is now giving up the spirit, betrayed by its most trusted companion, the signifier. What is left is linear and nonlinear textuality, or better, linear and nonlinear textualities. This empirical evolution makes possible a shift in method from a philological to an anthropological approach in which the object of study is a process (the changing text) rather than a project (the static text). On-line phenomena and particularly the MUDs, with their fluid exchanges of textual praxis, offer unique opportunities for the study of rhetoric, semiotics, and cultural communication in general.

MUDs and similar nonlocal forms of instant textual communication can be studied from many perspectives in the human sciences; psychological, sociological, anthropological, linguistic, philosophical, historical, etc. Shades of these will inevitably find their way into the literary and textual perspectives that we might expect from our own discipline. If literary theorists and critics do engage in the study of indeterminate cybertexts, it should be with an awareness that

the old role of a *posteriori* investigator no longer suffices. Like the user, the critic must be there when it happens. Not only that but, like the participant observer of social anthropology, he or she must make it happen—improvise, mingle with the natives, play roles, provoke response.

What, may we ask, will then be the difference between this literary anthropology and a real anthropologist's investigation of on-line phenomena? In other words, what keeps criticism from changing into a sub-discipline of traditional social anthropology? First, it must be noted that social anthropology and literary theory already have several perspectives and goals in common, and a recent history of mutual influence. In cultural anthropology, cultures are treated as texts to be interpreted and subjected to critique,³⁶ and even the problem of anthropological method as a literary process has become a concern.³⁷

In the transient social textualities, the ontologies of the two traditions might seem to converge, and the boundaries between cultural anthropology and literary theory may appear fuzzier than ever. It could therefore be useful to explore some problems and conflicts of perspective that might await eventual partnerships of the two fields. Since MUDs and other indeterminate cybertexts are closed signification systems, that is, textual types, they should not be analyzed as traditional cultures or subcultures. The postorganic anthropology solicited in a recent essay on the phenomenon known as cyberspace is perhaps just another term for what literary critics have been doing since Plato.³⁸ To be analyzed and defined, a culture must be shown to exist independently of any one signification system. When a science starts to confuse its metaphors with its empirical substratum (for example when "texts" become texts), it is dangerously close to becoming a mythology. An anthropology of MUDs, for instance, should not see as its primary object the rituals and interactions between the characters inside; but rather the relation between the outside participants (the users) and their inside symbolic actions. Literary theory, on the other hand, should not focus on the social behavior made possible by textual symbols, but on how the sign system is used to construct and explore the possibility of a text-based representation of identity. If a cooperation between anthropology and textual criticism is to be achieved, the two disciplines should not try to do each other's work, or mistake the other's ontology for its own.

After these speculations the question remains: What will the study of nonlinearity and cybertextuality do to literary theory? At this point there can be no clear answer. Between the blurry promises of technology and the sharp edges of political reality there is, in the words of Jacques Derrida, "as yet no *exergue*." This essay has attempted to create a usable terminology for the study of a wider range of textualities than has hitherto been acknowledged by the field of literary study and to point to some current problems and challenges in the study of computer-mediated textualities. As we have seen, fundamental structural terms like *story*, *plot*, *fiction*, and *narrative* are not always suitable to describe the nonlinear textualities. To use them without qualification is clearly irresponsible. The figures of nonlinearity suggest that one must revise literary terminology and poetics in order to avoid further confusion and unnecessary ambiguity. Some of my reconfigurations of these literary and theoretical concepts might turn out to be unnecessary, and others are probably not radical enough. As I have shown, in addition to hypertext there is a wealth of nonlinear text types, from ancient inscriptions to sophisticated computer programs based on the latest semantic research. I have not tried to present an exhaustive empirical survey of such types or to give a detailed historical exposition of the development and spread of textual nonlinearity. Others are very welcome to either of these tasks; I have no intention of taking them on. Nor do I believe that there is any need to construct a historical tradition of nonlinear literature, as the specimens I have seen so far seem to be different from and isolated from each other rather than belong to anything that can reasonably be characterized as a common genre. There are undoubtedly local traditions, but nonlinear strategies appear to rise out of a prevalent and trans-historic need to compose a practical effect, perpendicular to linear textuality, but usually with a specific and constructive or subversive rather than sensationalistic or frivolous objective.

When confronted with new data that is recognized as relevant but unusual, an academic discipline such as literary studies can employ at least two different tactics to harmonize the situation. The existing theories may be used to grasp and focus the new material (the intruder is tamed), or the new material can be used to reevaluate and modify the old perspectives (the field is changed). Here I have focused not on the effects and insights produced by the various branches of

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literary theory when applied to nonlinear texts but on the potential for new perspectives on literature in general that the study of nonlinear textuality might bring us. Nonlinear texts and literary theories may have a lot to say to each other, but we should not let only one side do all the talking.

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