Charting Maps and Raising the Dead:
Readers' Encounters with Hypertext Fiction

[In discourse] all the logical small change is in the interstices.
—Roland Barthes, *The Pleasure of the Text* (1975)

The essence of cinema, it has been suggested, is the cut.[1] What is a film, after all, other than a succession of strips of celluloid, a series of various shots linked together with editors' tape and shown as one continuous strip? As we sit in darkened cinemas watching features by the likes of Hitchcock and Sirk—or even Coppola and Scorsese—we no longer see the cuts or the edits: we see the connections. If we see a shot of an unshaven man half-heartedly slurping soup in a grimy diner, followed by a shot of an impeccably groomed croupier presiding over a craps table in a crowded casino, followed by a shot of an elderly woman lying amid a forest of tubes, drains, and drips in an intensive-care unit, we do not perceive a sequence of random shots or images. Instead, we see this sequence as either a piece of scene setting, establishing locations that will later play critical roles in the narrative as it unfolds, or as an introduction to the narrative's dramatis personae. We also tend to assume that these shots are joined in roughly chronological time, that we are dipping into these characters' lives at approximately the same time, and that the coupling of their lives in this short sequence of shots anticipates real interactions and encounters to be revealed during the course of the film.

Are these assumptions learned, our expectations the natural outcome of our being thoroughly schooled in the grammar of cinema, or are they endemic to our way of perceiving the world? In the fledgling Soviet Union, due to an acute shortage of film stock, pioneer film theorist Lev Kuleshov found himself able to create films only by slicing and splicing existing film footage from wildly different sources. Using a single, lengthy take of an actor's face with a neutral expression, Kuleshov sliced it into three equal segments and intercut these with images of a bowl of steaming food, a dressed out corpse, and a child

playing. When he projected his completed "film" to an audience barely conversant with the new medium, however, they praised the actor's subtle ability to convincingly portray the emotions of hunger, grief, and joy.[2] Our ability to perceive connections such as these, clearly, has little to do with our knowledge of the grammar of shot–reaction shot (which dictates that each shot following the close-up of the actor's face reveal the objects he or she sees) and everything to do with the nature of human perception.

Narrative, Jerome Bruner has argued, can be defined by a single, serviceable criterion: narrative is that which deals with the "vicissitudes of intention." The reason for the role of intention in defining narrative is clear, he continues: "[I]ntention is immediately and intuitively recognizable: it seems to require for its recognition no complex or sophisticated interpretive act on the part of the beholder."[3]

Narratives, in a sense, are about connectedness, sequence, order—qualities that are inextricably linked to the way we view the world around us. We might even say that narratives represent a reflection of our tendency to perceive the world in terms of intentional or causal states, albeit a reflection that produces an orderly, predictable, and complete world within a static structure. But if this mode of perception is part of what makes narratives so attractive to us and, apparently, so important a component of our lives, it is also integral to our being able to read, interpret, and understand narratives at all.

Most theories of reading have ignored the biases of human perception toward "seeing" causality and intention even where these qualities may not exist. In a study of perception conducted in Belgium in the early 1960s, subjects asked to watch projected images of moving, animated objects persistently saw causation connecting movements. Invariably, subjects discussed the movements they had watched in strictly causal terms, with the objects perceived as "dragging," or "deflecting" one another. Although the subjects were conversant with physical laws that could explain the movement of the objects they saw, the presentation of two or more objects invariably prompted the subjects to see their movements as strictly "caused."[4] In a similar experiment, psychologists Fritz Heider and Marianne Simmel also projected an animated film featuring a small moving triangle, a minute moving circle, a large moving square, and an empty rectangle to viewing subjects who unanimously described their movements in animate, causal, or intentional terms.[5] More recent studies have shown that subjects even arrange the space-time relationships between simple figures to reinforce their readings of intention—or simply as part of their inability to perceive events independent of

intentional states.[6] And Alan Leslie's research conducted on six month-old babies has demonstrated that infants react with changes of facial expression, heart rate, and blood pressure when cinematic sequences representing noncausal relationships appeared sandwiched between sequences portraying causal connections.[7] Our tendency to perceive the world according to causal or intentional states seems endemic to our being human.

Human perception, however, also seems to work in the opposite direction, erasing "noise" when a strong signal is present, enabling us to hear only what we perceive as meaningful and to ignore anything extraneous that intrudes. Subjects in an experiment conducted by psychologist Richard Warren listened to spoken sentences recorded on tape on which a few phonemes had been erased and replaced by the sound of a dry cough. When asked to repeat what they had heard, the subjects overwhelmingly reported having "heard" the missing phonemes as precisely as if they had been present on the tape. Yet when an undoctored version of the sentences was played back to them, none of the subjects could distinguish the sounds they had imagined they had heard from the sounds they had actually heard— nor could they pinpoint the cough's location amid the sentences. As the cough existed outside any meaningful sequence for these listeners, their perceptions excluded it, but when a brief silence replaced the cough mimicking a speaker's pausing for emphasis, all the listeners were able to fix its exact location without difficulty.[8] The brain, apparently, does not preserve sequences step by step but, instead, recognizes overall patterns.[9] Our not necessarily conscious but prior recognition of these patterns enables us to unconsciously synthesize gaps such as missing phonemes without noticeable effort.[10]

It is our perceptions, then, and not the hand of a Scorsese or a Hitchcock that creates the illusion of continuity, sequence, and causation as we sit in a darkened cinema, showing us a steady sequence of moving images—where, in fact, only flickering, still images exist. As any cinema theorist will quickly inform you, nearly half the time we spend at the movies is, in fact, spent in the blackness between frames. Working together, the human eye and brain play off what Gestalt psychologists call the "phi phenomenon" and motion parallax to produce the fluid, tangible reproduction of life to which we have become accustomed onscreen.[11] What probably began as interpretive skills needed to ensure our survival in a highly competitive, natural environment now also endow objects and actions in the world around us with a continuity and a richness of meaning that enables aesthetic objects to exist and to retain meaning and significance for us.

Noting that Douglas Hofstadter has suggested the perception of relatedness, or connections, is perhaps the single, definitive characteristic of intelligent behavior, media theorist John Slatin argues that the link is the defining characteristic of hypertext:

> [E]verything in hypertext depends on linkage, upon connectivity between and among the various elements in the system. Linkage, in hypertext, plays a role corresponding to that of sequence in conventional text. . . . [T]he link *simulates* the connections in the mind of the author or reader.[12]

Hypertextual links or connections, of course, bridge the very physical gaps yawning between segments of text separated by virtual, three-dimensional space. Yet the links have no textual content themselves, and few cues that might prompt readers to see them as anything but a merely physical connection between two segments of text.[13] Although you might be able to see all the bridges between one segment and another in a hypertext narrative by peering at a map of it or browsing through menu options, no mutual set of conventions shared by authors and readers guides you in your choices. Some pathways might be given titles that are puns on their contents, some might even be helpful (as when the title to a path or place answers a question in the text), but their assistance to your navigation through the text is strictly a hit-or-miss proposition. In any case, attempts to paraphrase the contents of a fictitious passage are themselves problematic, hypertext or no hypertext, as anyone who has read Cleanth Brooks's "Heresy of Paraphrase" will tell you.

Yet if we recall the discoveries of the response theorists and psycholinguists of reading, we are confronted daily with gaps everywhere in the texts we read. They are even, critic Shlomith Rimmon-Kenan argues, inescapable:

> Holes or gaps are so central in narrative fiction because the materials the text provides for the reconstruction of the world (or a story) are insufficient for saturation. No matter how detailed the presentation is, further questions can always be asked; gaps always remain open.[14]

As Iser has succinctly noted, narratives represent opportunities for us "to bring into play our own faculty for establishing connections—for filling in gaps left by the text itself."[15] Gaps are precisely what enables us to engage in the act of "directed creation" so lauded by theorists

from Sartre to Barthes, by leaving readers with what Sterne in *Tristram Shandy* called "something to imagine."[16] The reason why we so seldom glimpse these gaps—except in student writing, perhaps, or in our own writings in progress—is largely a function of human perception and only secondarily of literary convention. Conventions, as we shall see, are often little more than labels that we give to connections already, even inevitably, perceived between two objects or segments of text.

Text into Hypertext

Marc Saporta's *Composition No. 1*, a fictional narrative consisting of about 150 unnumbered, loose sheets of paper, is the first documented published work of fiction that required readers to compose the narrative themselves by shuffling the pages prior to reading them.[17] More radical in composition than Julio Cortázar's *Hopscotch,* which was to follow three years later, Saporta's text demanded that readers shuffle the pages of the narrative like a deck of Tarot cards, cut, and then read the cards to determine the fate of X, the protagonist. Similarly, in *Hopscotch,* Cortázar establishes two orders for reading his text, obliging readers to work out possible connections between chapters, such as location, chronology, and causality. In Saporta's narrative, however, readers are cast further adrift from the fixity of print, since the narrative, diced up into discrete cards, provides no such obvious script for readers to follow, leaving some commentators to conclude, as Bolter has, that the work never existed in a unified, complete form before its splintering into cards.[18] Looked at another way, Bolter's perception that the fragmented *Composition No. 1* may never initially have been a single, whole narrative owes less, perhaps, to what he sees as the elliptical character of the narrative than it does to the cuts introduced into the printed text.

Once you cut a text into fragments, essentially, you can liberate all the subversive, alternative connections possible between segments. To introduce physical cuts into a narrative and then present the whole thing to readers without any apparent order is to wrench the lid off Pandora's box and let rip the clamorous legion of voices identified by Barthes. At least, that was what I suspected when I sliced a short story into forty segments that ranged in length from a single word to three paragraphs. To test my hypothesis, I shuffled the fragments, stuffed them into envelopes, and handed these out to a class at New York University that consisted of twenty graduate students

enrolled in a course in narratology. Organizing the students into ten pairs, I asked the class to place the fragments of the story in the order in which they thought it originally had existed, which enabled me to eavesdrop on the discussions, logic, and occasional squabbles between members of each pair as they worked their way, over an hour and a half of class time, toward a consensus about where each fragment "really" belonged.

As the pairs bent over their scraps of paper and began sorting through them, a surprising variety of strategies for assembling the text quickly revealed itself. Some teams began grouping similar actions they found in the text of the strips together ("There's an examination going on here and here: we have to put this one with that one"), and also clumping together fragments that had similar subjects or words in common. One pair placed three fragments together, all mentioning the names of cocktails or showing characters drinking. Most of the teams, however, began by reading each of the fragments and attempting to categorize the pieces according to literary conventions, with pieces sorted out according to

Their appearing to present "beginning," or "background" information

Their status as "kernels," elements essential to the plot, or "satellites," elements not essential to the plot, both structuralist concepts acquired during the course

Their presentation of "action" sequences

Their status as "exposition" or "descriptions" of characters or settings

Their appearing to supply "transitions" between sequences

The "voice" of the two characters in the story

The perceived "tone" of the narration

The sorting of narrative segments in nearly all pairs occupied the largest portion of the class time, and the pace of the assembly of the narrative, in most instances, quickened in direct proportion to the number of narrative fragments placed down in a narrative order agreed upon between the pairs. The more pieces a pair assembled, the more rapidly they proceeded to place the remaining fragments into a complete narrative order. Most strikingly, the teams appeared to rely upon

similar strategies for constructing their respective narratives. First, they read through the individual fragments and attempted to articulate from them a global view of what the narrative might look like as a whole. Next, they attempted to find causal connections between actions or events from among the fragments to establish sequences or chronologies for what had happened. Finally, they "tested" these between themselves according to either their own life experiences or their knowledge of other narratives.

In the initial stages of assembling their narratives, nearly all pairs attempted to articulate between them some concept of what the work looked like as a whole, as what Teun van Dijk has called a "macrostructure," a global view of the narrative's themes and meaning.[19] For example, a number of pairs saw a fragment that read, "Two scenes ensue and we follow them both, you and I, *ma voyeuse charmante*," as a thesis statement, prompting them to organize the narrative into two scenes. Other teams perceived a pattern of alternation between the presentation of characters and ordered the narrative fragments strictly according to whether they featured the male protagonist or the female protagonist in them. And one pair decided that the story structure involved first a presentation of the male protagonist's problems, then the female protagonist's problems, followed by the interaction between them and, finally, exposition. These concepts of the narrative's macrostructure enabled the pairs to then establish scripts, or structures describing a sequence of events appropriate to a specific context—again, based upon their knowledge of human behavior and of literary conventions—enabling them to sort the fragments before them into some causal order and, after that, to establish narrative sequences.[20] As the pairs shuffled their fragments into sequences, they tried the order out on each other by telling narrative sequences aloud and applied their final, acid test to the narrative sequence or sequences after they told it. Each "telling" was subjected to the criterion of plausibility and/or a knowledge of narrative expectations based upon other works, their discussions showed:

"He wins her here, but she's annoyed at him here, so this scene has to take place after he wins her."

"If he operates on her and she gets mad at him because of it, then they wouldn't just be hanging out together like this."

"They get together at first, but then they fall out, so he has to win her back. That's how it ends."

After every group had completed their versions of the story, I provided each pair with a copy of the short story in its original form—and watched numerous sets of eyebrows rising and falling in disbelief at the difference between the scripts they had concocted and the scripts present in the original story. Several pairs complained how difficult it had been to read the story and to read it in different ways, in effect complaining that Bolter's requirement that we read in multiple ways forces us to "resist the temptation to close off possible courses of action; [and] . . . keep open multiple explanations for the same event or character."[21] The task, he goes on to note, is nearly impossible when we read print narratives because the medium itself, with its printed letters and words locked uniformly into lines, encourages us to think of it as a changeless, closed, and authoritative way of framing the events we see—as the *only* way of representing the events and characters we see within it (144). Even though Saporta's *Composition No. 1* is delivered to us in printed cards, piled in a box, our first instinct, ironically, is to find a way to put it back together again, to recover its "original" order. The static, fixed nature of the printed page and its austere linearity make it ideal for the presentation of a single order. Attempting to read a print story multiply—even one deliberately cut into fragments, or even, in the case of Saporta's narrative, overtly created as contradictory fragments—can never be more than an endeavor to fly in the face of the essential predispositions of the medium. Our perceptual bias toward seeing connections and causation enables us to create certain narrative sequences, as evidenced by the ease with which all pairs were able to arrange narrative fragments into causal clusters. The greatest difficulty facing the groups, however, lay in finding what seemed to be the definitive sequence that securely locked all the elements into place. If the print medium encourages us to see narrative events in a linear, singular, and definitive order, why did this last task prove so elusive?

First, *narratives themselves are filled with gaps.* As we have seen, gaps or indeterminacies in narratives are what enable readers to engage in transactions with texts, to breathe life into them. Since written language is itself indeterminate, there is no way for even the most "realistic" of narratives to represent characters and events completely concretely and wholly determinately. Many of the readers in my test group despaired of ever putting the story together, claiming that the original story itself must have been excessively, even incomprehensibly fragmented—only to express surprise at how coherent and even "obvious" the narrative sequence seemed, once they had read the orig-

inal story. Good writing, as John Slatin has noted, involves presenting in print what seems to be not simply the most obvious, logical, and convincing order but, ultimately, the *only* possible order of events—one that seems "somehow inevitable."[22] Our tendency to perceive connections between objects and events in the text generally focuses on the way that the lines of print before us follow one another apparently seamlessly, locked into place. The physical substance of the page and the authority of the printed word combine to make these links seem definitive and to obscure any gaps yawning between actions or inferences. But when the text has been cut up, the gaps can threaten to engulf any glimmerings of coherence the narrative may originally have had.

Second, *all narratives have multiple connections, sequences, and orders other than the linear, syllogistic, or sequential order endemic to print narratives.* The very austerity of print with its singular order and relentlessly syllogistic, sequential connections, makes reading easier for us, in that it turns our predictions about where the text is heading and what to expect in the next sentence and paragraph into reasonably straightforward affairs. Other associative or thematic connections are driven beneath the surface of the text by its conventional linearity and tend not to haunt us until we are picking over the text very carefully, looking for little tufts of discord breaking through the surface. Although these alternative connections are available to us in retrospect when we read print narratives, we do not have to contend with them. Nor are we obliged to grapple, as we read, with the way in which these other, subversive orders may affect our perception of the narrative as a macrostructure. When these linear linkages are broken, however—as they were in the fragmented short story—readers are confronted with a plethora of possible and probable connections, boosted by our perceptual tendency to see links between characters and events that may, in fact, be entirely unrelated.

Third, *the fragmented print text prevented readers from "locking" into a single script or perceiving the narrative as a single, global macrostructure.* The "openness" of the fragmented narrative, with its many possible connections made overt by the cuts between paragraphs, made it difficult for readers to latch onto a specific script or schema that could enable them to assemble a singular and conclusive version of the narrative. Throughout the process, many were haunted by other possible connections, spurring them to invent explanations that rivaled the fiction itself as feats of imagination. Two groups insisted that the fragments were drawn from at least two different sto-

ries, making it impossible for them to create a single narrative order. One pair argued that the orphaned fragments they were unable to reconcile with the rest of "their" story had belonged to another story or stories and had somehow found their way into the envelope I had given them. And no fewer than four sets of readers claimed that crucial fragments had been left out of their envelopes, leaving them with gaps in their respective narratives that were unbridgeable. No readers, however, assumed that the fragments could have been constructed into multiple narratives that relied on the use of some segments more than once, since I had told them the bits of narrative in their envelopes came from a single print story. One group, perhaps taking their first, uncertain steps toward reading multiply, did, however, insist that their version of the narrative made richer, more probable, and satisfactory use of its contents than the original print short story.

For the readers overall, the "advantage" of the print narrative was that it held all the disparate connections and probable links between items, events, and characters in a single order that constrained ambiguity and supplied a limited and determinate closure for the events it described. But the print narrative also closed off other possible orders and alternate connections that clearly existed in the text, orders that were apparent when the narrative had been splintered into fragments. The pairs of readers could only attempt to lay the narrative fragments out in long chains of text (more than half the pairs actually spread the pieces out in strips on desks, tables, or the floor), because they were working with a print narrative, however fragmented. As we all know, print technology, as one of its chief "rules," does not allow you to include the same fragment in more than one narrative sequence, nor does it permit you to organize the fragments into mutually exclusive narrative sequences. Although many of the pairs were obviously reading multiply—as their complaints about having fragments from other stories in their envelopes attest—to read multiply in a print setting, to see an array of mutually exclusive possibilities for assembling the text, can only be disabling, a way of perceiving print text that does not lend itself to the discovery of the "right" narrative order. Nonetheless, nearly every one of the readers involved had, at some point or other during the exercise, managed to dredge up multiple possibilities for connections between blocks of text. In fact, many of the readers commented on the austerity of the connections in the uncut version of the story—probably because it represented a considerable reduction of flourishing links they themselves had perceived during the assembly of their respective versions of the story.

Two Kinds of Forking Paths

> In conventional narratives, readers are asked to imagine a
> world of multiplicity from within an overwhelmingly linear
> and exclusive medium. For hypertextual readers, the situa-
> tion is reversed—given a text that may contain almost any
> permutation of a given narrative situation, their task is to
> elicit a rational reduction of this field of possibilities that
> answers to their own engagement with the text.
> —Stuart Moulthrop, "Reading from the Map" (1991)

One might assume, perhaps, since hypertext has generated such a
buzz over its potential for reconfiguring the roles of author and reader,
that academia would be swamped under a tsunami of articles scruti-
nizing how readers handle hypertext. Instead, you would be hard
pressed to come up with an even dozen studies or considerations of
how hypertext may transform the way we read or write texts, and,
indeed, our whole conception of a satisfactory reading experience.
While you might find articles that examine the ways in which readers
can become disoriented in hypertext, mostly from the perspectives of
interface design and software engineering, you could also emerge from
a survey of the field wondering what happens when readers come face
to face with the technology. So, ironically, we have only the slenderest
knowledge of what is, quite possibly, the most important component
of the medium: the way in which readers interact with it. How do
readers conditioned to poring over linear narratives with tangible end-
ings react when they run up against stories without endings, texts that
change with each reader and reading?

I thought "Forking Paths" represented as fair a litmus test as I was
likely to find—and not simply because it was one of only three hyper-
texts narratives in circulation back in 1987. Not only was the hyper-
text erected around a complex print story, providing common touch-
stones that could remain constant across readings of both the print
and hypertext narratives, but Borges's "The Garden of Forking
Paths"—as we already noted in chapter 3—was also a print story that
strains to escape from the confines of the medium. The class consisted
of freshmen writers in an honors expository writing course, held in a
networked Macintosh writing lab, the second of a two-course
sequence required of all New York University undergraduates. With-
out providing class members with any description of the experiment,
I divided them into two groups, with each instructed merely to read

either the print story "The Garden of Forking Paths" or the hypertext "Forking Paths" and then to recount their reading experiences and to retell the story they encountered in several paragraphs. For the first few minutes, half the class was originally disgruntled at being saddled with something as mundane as a print short story—many of the print readers ignoring the story to crane their necks in the hope of glimpsing what the others were doing at their Macintoshes. The other half was delighted at playing around with what looked like whizzy new software, until they ran up against a few navigational roadblocks. Admittedly, the software was, itself, problematic: this particular version of "Forking Paths" was accessible through an experimental, read-only module of a beta version of Storyspace, which barred readers from seeing either a map of the text or from browsing through lists of paths branching out from any particular place. Yet these factors alone are hardly huge obstacles that readers need to weave around: a number of hypertexts use a read-only form of the Storyspace interface similar to the "Forking Paths" version. What made blazing a trail through Moulthrop's hypertext difficult was this: "Forking Paths" did not contain any paths, strictly speaking, or defaults. Instead, it was constructed of a dense network of links that connected one segment of text to another through the conduit of words in the text. To continue reading, you needed to find words that would trigger links to other places containing related concepts, or the same word, or a similar word situated in a completely different context. If your choice of a likely candidate failed, however, to match the words included in the guardfield condition for the link—scripts attached to each link that required readers to select specific words from the text of any segment in order to move onward—the only action you would end up triggering was a frustrating beep from the Macintosh that informed you the word you selected was not attached to any link.

Unknown to either myself or my students at the time, Stuart Moulthrop was still in the process of writing full-blown instructions for readers of "Forking Paths," which he considered "crucial" to the reading of his interactive narrative. As he grappled with the hypertext, however, Moulthrop himself had forgotten that the read-only interface contained a set of control buttons enabling readers to move up, down, left, or right within the structure of the interactive narrative and to float around inside the hypertext independent of any connections between places.[23] To further complicate matters, "Forking Paths" had originally been created to run via a rudimentary text-linking program of Moulthrop's own devising that permitted only linked connections between nodes. When he decided to adapt the hypertext to a then still-

provisional version of Storyspace, Moulthrop deliberately neglected to build default connections into the hypertext, intending his narrative to oblige his readers "to assume the mantle of authorship and expand the existing structure" (126).

Convinced that a hypertext structure such as "Forking Paths" would invite readers to become coauthors, Moulthrop had assumed that readers would become engaged by the text as structure at the level of words and phrases within each node, following the contentions of Russian Formalists and other theorists of reading—as formulated by Peter Brooks in *Reading for the Plot:*

> [W]e read the incidents of narration as "promises and annunciations" of final coherence, that metaphor that may be reached through the chain of metonymies: across the bulk of the as yet unread middle pages, the end calls to the beginning, transforms and enhances it.[24]

The most problematic aspect of this chain of metonymies, of course, is that readers—even those who most nearly match or realize the desires, intentions, quirks, and readerly history of an author's ideal audience—will not construe the same words as being meaningful, crucial, or intriguing in any given passage. It all goes back to the Iserian notion of the text as a quasi-determinate entity. When I read a word or phrase in the context of a compound-complex sentence, a sequence involving causation, or a novel with clearly defined characters and motifs, my concept of the connotative meaning of the word or phrase is sufficiently constrained to keep me from construing them in a far-out way. When, however, you ask me to relate my feelings about the word *war,* or *pink,* or *hatred,* the words tend to become something of a Rorschach test, prompting what can be a whole flood of associations, many of them totally unrelated to their immediate context in the narrative. As a result, initially, few of my students found themselves able to locate the words Moulthrop had selected as the anchors for his links—which meant they could not move through the text. Part of the reason behind Moulthrop's refusal to include defaults in his Storyspace structure stemmed from his desire for readers of "Forking Paths" to know when they had engaged a link. Had he incorporated defaults into the hypertext connections, readers would have moved through the text, regardless of whether they had activated a link or not. Certainly a "no-default" condition, as we saw in the last chapter, is considered integral to true interactivity, so that neither the author nor the reader of a hypertext has recourse to a single, predictable, and

primary pathway through the hypertext network. Because of this no-default condition, however, what ideally should have promoted more interaction between reader and text stymied readers' efforts to engage the text on any terms but those the author had prescribed.

Predictably, the readers assigned "Forking Paths" became frustrated with what seemed to be odd software that just didn't work. Since they failed repeatedly to find words that yielded links, they complained that they could not read at all. Soon, however, one or two of the readers fiddling with the interface discovered that directional "up," "down," "left," and "right" buttons could pilot them through the virtual, three-dimensional space of the hypertext structure—completely outside the structure of links and projected interactions Moulthrop had scripted. The "right" directional button, quite helpfully, invariably yielded fresh places to read, and soon the readers were concluding that this was the only way they could move through the narrative at all, as if "Forking Paths" were a vast maze with dummy controls and lots of dead-ends. One reader noted that

> with very few exceptions, "right" was the only choice one could make in terms of movement within the story. The "up" option always took you back to the beginning, which was frustrating. . . . It was an interesting experience, and if there were more travel options (other than just "right"), I would have enjoyed it more.

Eventually, all seven of the readers given the interactive "Forking Paths" followed suit, using the "right" option to move through the text, and two ended up giving complete priority to the sense of the text they derived from navigating through the hypertext structure rather than their readings of the text contained in it. Confused by a multiplicity of narrative strands in which they could encounter a character dead in one place and very much alive and ambulatory in the next, the readers of "Forking Paths" drifted through the hypertext without any tangible sense of a macrostructure that could confer significance on the elements they encountered in any given narrative segment. Only by using their sense of the narrative as a virtual yet tangible structure could any of the readers arrive at a sense of the relationship between individual narrative places and their relation to the hypertext as a whole.

As hypertext theorists have discovered, perfectly acceptable hypotheses about what readers do with *Madame Bovary* are not a whole lot of help at describing what readers do with the likes of "Fork-

ing Paths." Moulthrop had constructed "Forking Paths" around Peter Brooks's conviction that readers entangle themselves in metonymic webs of language that ultimately lead them to metaphors for the text as a whole. But when Moulthrop sifted through my students' responses to his hypertext, he found them not reading for the plot so much as trying to plot their readings—struggling to establish where the particular places they read belonged inside the framework of the hypertext.

Rather than conferring a certain value on a scene because they perceived in it reflections of larger themes in the work, they instead attached significance to what they read because of the space it occupied in relation to the work as a whole. Neither of these reading strategies is, however, unique to reading novels or hypertext fiction. For example, let's say I am watching the last shot of the infamous shower scene in *Psycho.* As the camera spirals in toward Janet Leigh's lifeless, unseeing eye, I can begin to cobble together motifs in the scene (the cinematic equivalent of Brooks's metonymies)—the showerhead, the drain, the unblinking eye—perhaps recall others like it in earlier scenes, like Tony Perkins's eye fixed to the hole in the motel room wall, and begin to see the film as a cinematic treatise on voyeurism and madness, instead of a film about adultery and embezzlement, Hitchcock's famous red herrings that begin the whole enterprise. That is the metonymies-into-metaphor view.

I could, however, also decide that the film cannot just be about adultery or the wads of stolen bills still stuffed in Janet Leigh's suitcase when she is hacked to death only a third of the way through the film. Her murder is too explosive an event that occurs too early in the film for it to continue as a conventional thriller about adultery and stolen money. But her death is sufficiently early in the narrative for me to assume that the film will change into a story about the hunt for her killer or the other victims her murderer might rack up. We could dub this the "time-space" approach to reading. It is what enables us to chew our way unperturbed through a tub of popcorn as we watch Keanu Reeves hanging from the underside of a speeding bus in *Speed* because we know it is far too early in the narrative for anyone significant, let alone the hero, to die—unless, that is, he or she stars in a film directed by Hitchcock.

In any case, it is a strategy that is difficult to observe in your average print reader, since one always comes to a book with an absolute knowledge of how long it is, and a reader can, in any case, as Barthes reminds us in *The Pleasure of the Text,* always cheat a little, skip ahead, see what is coming next. What is striking, however, about this

kind of interpretive maneuvering by the readers of "Forking Paths" is that they were guided by something they assumed but could not perceive. Although they could not see the map of "Forking Paths" while they were reading, they knew that its segments were like points on a map, as they could visit them by using directional tools. Since they had no clear idea of what the map looked like, their explorations were as much about getting a sense of the layout of the text and a map of narrative possibilities as they were about the placement and contents of any one segment within it. The map became, in a sense, a metaphor that represented the sum of the narrative's possibilities—turning on its head the print relationship between metonymy and metaphor suggested by Brooks.

Of course, print readers act somewhat like this—knowing that my edition of *Moby-Dick* has 536 pages in it does not help me understand what to make of Ahab's obsession with the whale or the significance of the doubloon the whalers nail to the *Pequod*'s mast, let alone Ishmael's relationship with Queequeg or the "Extracts (Supplied by a sub-sub librarian)" that preface the novel. And even knowing that this particular novel has been canonized as Great Literature and is about whales, or God, or the impenetrable face of Nature, does not make my reading of it as straightforward as swallowing ice cream. Just as we recognize what is happening in a scene from scripts we have learned elsewhere, we can use a script to guide us only when we can recognize its applicability to the scene at hand. Like readers of print fiction, their counterparts plowing through "Forking Paths" were simply doing what readers do: shuttling between microstructures and macrostructure, hopscotching back and forth between global structure, genre, and local meanings, as Jerome Bruner has observed:

> [A] reader goes from stones to arches to the significance of arches . . . goes back and forth between them attempting finally to construct a sense of the story, its form, its meaning. . . . As readers read, as they begin to construct a virtual text of their own, it is as if they were embarking on a journey without maps.[25]

Unlike print readers, who can draw on a vast repertoire of knowledge about genres, texts, and literary conventions, the readers of "Forking Paths" trudged through what seemed a trackless waste. What they could glean of the content—what actually happened in each segment of text—depended on an apparatus controlling their movements governed by rules that they could not quite fathom. And

since they knew the hypertext was not linear, intuiting where the "ending" fell and what occurred in it would be pointless if it were not already impossible. One reader, however, made a game attempt to confer on the story some semblance of the orderly narrative strands and closure familiar from print stories:

> Yu Tsun later shot himself between the eyes but survived, he later became the ward of Herr Ignazius Baumgartner. Suddenly, he found himself in a garden maze, Madden and Stephen were also present in the maze, it is at this point, he had difficulty identifying his allegiance, was it to Elisa or Germany? . . . He leaves the room and found himself in the crossroad of the garden maze once again. Remembering dreaming about Amelie for the last nine nights, he confronted Madden and declared his renunciation of Berlin, the service and the chief. He was tired of the game, and so was Madden, [*sic*] Madden felt the same way. They became friends since they now share the same point of view.

As a synopsis of a conventional story, this seems reminiscent of the attempt by a contemporary of Sterne's who tried to take on *Tristram Shandy* by beginning with a gloss on the story and its plot and ended up wading through pages of description that seem destined, like Tristram's "autobiography," never to catch up to the task at hand. The summary of "Forking Paths" meanders along but seems to convey a basic sense of what the narrative is "about," which is certainly more than some of the other readers managed. This version, nevertheless, does violence to the narrative, skimming blithely across episodes that bring the narrative to (in some versions) a screeching halt—as when Yu Tsun shoots himself between the eyes. Had the reader continued along this particular branch of Moulthrop's web by alighting on the right words to trigger the next link, she might have discovered either that Yu's suicide attempt was entirely successful or that he had made a botch of it and ended up brain-dead (a possibility at least one other reader encountered). In her reading, Yu becomes a ward of Baumgartner—something possible only if the shot to the head has rendered him non compos mentis—reflects on his allegiances, bumbles through the labyrinth, opts to throw in the towel on the whole game of spying, and becomes pals with his former arch enemy, Richard Madden. Not bad going for someone who has taken a bullet squarely between the eyes.

What is remarkable about this reading of "Forking Paths" is the strenuous effort required to arrive at a synopsis that takes into

account all its disparate and often mutually contradictory narrative strands and resolves them into a neat, linear series of events. To follow this script, though, this reader, probably abetted by years of reading knotty postmodern novels, has to brush away others, ones that insist that people shot between the eyes usually do not survive, much less possess the kind of powers of persuasion required to convince accomplished members of the opposition to also hang it all up. As might be expected, other readers displayed distinct signs of tetchiness with the narrative for straying from familiar print conventions. "This was a confusing story. People were killed, and then there they were talking in the next cell of the story," wrote one reader, while another complained: "I found dead people coming back to life." Neither of them, however, seemed to be able to glide over these episodes that followed each other spatially but related utterly contradictory events. Perhaps the reader who produced this relentless synopsis "saw" continuity and sequentiality because she had been conditioned to read that way almost from the afternoon when she stumbled her way through her first written sentence—like Richard Warren's subjects who "heard" the missing phonemes that had been replaced by the sound of a cough. Instead of seeing closure, or the end to a narrative strand, she read each ending as a transition, a bridge to another branch of the narrative, a little like a soap where this or that character's biting the dust merely clears the way for a change in narrative gear to follow tomorrow or next week. By stringing together a narrative of sorts, this reader manages to produce something like a compelling story of espionage, divided loyalties, and a resolution, a fair approximation of the satisfactions readers pursue in more conventional settings, where they "expect the satisfaction of closure and the receipt of a message," as Frank Kermode insists, by relying on the interpretive strategies we use daily in our face-to-face encounters: "To attend to what complies with the proprieties, and by one means or another to eliminate from consideration whatever does not, is a time-honoured and perfectly respectable way of reading novels."[26]

None of the other readers attempted anything like this Herculean effort to wrest "Forking Paths" into something resembling a linear story—although two were decidedly peeved at the contents of the narrative for not adhering to familiar print conventions. For them, the multiple endings and the dense, junglelike matrix of stories nullified any scripts they had for interpreting books, television shows, and films—but it did leave them with a script for working with something familiar: a maze.

Few of the readers had experienced a horticultural maze, where

the ostensible objective of trotting around the topiary hedges is finding the center. Many of them had, though, stumbled across mazes in game books as children, where a confusion of paths separates a drawing of a treasure chest or a wedge of cheese at the center from a graphic of a pirate or a lean and hungry-looking mouse clinging to the outermost edge, and where tracing a wavering line through the maze to the center represents the solution. And, of course, the readers battling with "Forking Paths" at their Macs also knew that their classmates were turning the pages of a story entitled "The Garden of Forking Paths," which may well have suggested a garden maze, familiar from films like *The Draughtsman's Contract* or (more likely) *The Shining.*

In any case, two of them went on to work out a map for "Forking Paths" that would direct them toward the center of the fiction, where, presumably, all would be revealed—or enough to put them out of their misery. One of the "cartographers" struggled through his reading by trying to plot the placement of each chunk of text he trudged through, only to find that his concept of what should be where did not map all that brilliantly onto "Forking Paths." "When I did actually figure out where I was, where I had been, and where I was going, the story said otherwise," he wrote disgustedly. "In other words, whether I knew what path I was following or not, the story was too disjointed or random to comprehend." The other map plotter, however, through more advantageous choices, serendipity, or cheerful perseverance, apparently found a closer relationship between map, structure, and content—perhaps helped by his relying on a mental model of a maze, which provided him with a goal of sorts:

> At first, the stories did not seem to interconnect at all, but they all began to relate and make more sense the deeper into the story I got. After reading about 15 cells, I got to "<closure>," but I was not satisfied that it was over, so I continued reading. I made it to the center, cell 76, and that wasn't any big revelation, either, although I admit it was a little exciting at first. (I was wondering what I had won!)

Obviously, something that exists in virtual three dimensions has a shape, or a lack of something like linearity, for a distinct purpose: "Forking Paths" is, like haiku and Pound's *Cantos,* an intentional object, something constructed that signifies. Ergo, its shape must have some relationship to what happens in the narratives—making the center the best candidate for the Solution, something akin to the closing

paragraphs of Faulkner's "A Rose for Emily," when the bad smells, the disappearance of her suitor, the immobility of the figure watching from the window are all resolved, all accounted for, all consumed by the surfacing of information we have been missing all along. Although he's an astute reader to have come this far, his script will inevitably fail him because it is based on, and abides by, laws governing the physical world. The maze can have only one center; stories (and lives) have only one ending. In one possible version of the text, the center actually does represent closure. In others, however, you can reach half a dozen endings without ever approaching it.

Looked at another way, however (since hypertext inevitably reminds us that there are always other ways of experiencing things), the reader may well have been learning a script as he read. The deeper he penetrates into the web of the hypertext as he shuffles to the right, the more the segments seem to be resolving into fragments of sequences, albeit splinters of several different narratives encountered in a mostly higgledy-piggledy fashion. He recognizes connections but cannot arrive at resolutions to the narratives that swim past him, so he tries to look to the external structure of the text for clues. When these prove elusive, however, he resorts to his own definition of closure: visiting most of the points on the map he's constructed of the structure of "Forking Paths." His decision to declare his discovery of closure on his own terms is worth wondering at, since it has no precedent. While it might be kosher for me to decide that the ending of *Jacob's Ladder* is completely unsatisfactory and nullifies rather than accounts for what preceded it, it would be well-nigh impossible for me to declare that I had found a more satisfactory version of closure in the film.

Closure in stories, novels, films, and television series, even when it is left open to future episodes or sequels, is always determined by authors, screenwriters, directors, and producers. It is not something we as readers can take or leave. But, if readers realize they are dealing with possibilities and versions, rather than events that are immutable and determined, they also need to account for why they finished their readings. With the "Forking Paths" exercise, several of the readers confessed that they stopped when they became too frustrated or confused; some claimed they had simply run out of time; and a few argued that they had reached a sense of closure. When you reach the end of *Middlemarch* or *The 400 Blows*, although you can dicker over whether the ending was satisfactory or a disappointment, you cannot define closure as an abstract entity: it is an integral part of any published poem or piece of fiction. When you reach the "end" of "Forking

Paths," or *afternoon* or any other piece of hypertext fiction, however, closure becomes an entity that needs a lot of defining.

Endings, Closure, and Satisfaction

> We might say that we are able to read present moments—in literature and, by extension, in life—as endowed with narrative meaning only because we read them in anticipation of the structuring power of those endings that will retrospectively give them the order and significance of the plot.
>
> —Peter Brooks, *Reading for the Plot* (1985)

"The sense of adventure . . . plotted from its end," Peter Brooks writes, is part of a pattern of "anticipation and completion which overcodes mere succession."[27] Put another way, our expectation that *Presumed Innocent* will end with the revelation of the murderer's identity—as nearly all thrillers and mysteries that include corpses between their covers do—controls how we read the story from its beginning onward. Did he, or didn't he? we wonder. Could she or couldn't she?

Figuring out how something might end, the direction in which the narrative seems to be barreling along, helps orient us at the beginning, particularly when the signposts along the way are far from clear, as they were in "Forking Paths." Like the reader who fixed onto the concept of the text as a literal labyrinth or maze and headed straight for its center, our forming hypotheses about the kind of knot that will tie up the textual loose ends helps us interpret most of what happens along the way. Endings, or knowing how to find them, provide us with a goal, enabling us to sift through episodes and separate the distinctly goal-related ones ("He definitely did it: he was jealous of her sleeping around, particularly with his boss") from those that seem extraneous to the outcome of the plot ("So his wife is bright and frustrated—who cares?"). What seems, perhaps, most peculiar about the "Forking Paths" exercise are the reactions of the undergraduates who spent the class period poring over the Borges print story. They not only felt the ending of the print story was overdetermined, two readers even argued with its viability, insisting their own versions fit the outlines of the story's scheme far better:

> I figured out Tsun's [*sic*] motivation throughout this story after rereading the beginning of it, but that does not seem like

the point that [the story] was really trying to get put across. For all we know, the particular end used in this story may have been only one of an infinite number of possibilities down the "forking paths" of time.

Since, according to the all-wise Ts'ui Pên, all of these possibilities peacefully co-exist in parallel dimensions, isn't it true that we can reject this ending and make up one of our own? Dr. Stephen Albert even tells Tsun, after receiving his reverence, that in one possible future, the two men are enemies, and Tsun lamely replies that "The future already exists," lies to him, and then kills him; and all just to send a message to his German "Chief" whom he hates to prove the point that a "yellow man" was capable of saving the German forces.

This reader has decided that the spy plot, which provides the ostensible raison d'être for the story, is not really the subject of "The Garden of Forking Paths." The real story is about labyrinthine possibilities that exist in time, he argues, pointing out that Yu lacks sufficient motivation to shoot Albert dead—or, at any rate, that this is one of the less satisfying outcomes possible in the story. Since the story is all about labyrinths like Ts'ui Pên's, where "all possible solutions occur, each one being the point of departure for other bifurcations,"[28] it seems illogical for the story to end abruptly with Yu killing Albert and getting hanged himself for the crime.

The other resistant reader, having decided that the whole plot is riddled with inconsistencies (of which the ending is evidently the most glaring and frustrating example), homes in on what seem like logical flaws in the short story:

Tsun [*sic*] then kills Albert, and is captured by Madden to be sentenced to death. But in killing Albert he is able to convey the name of the city that the Germans have to attack to survive, which they did (attack, that is). But some questions remain: Why didn't Tsun just kill Albert and then leave, instead of remaining with Albert long enough to allow Madden to catch up with him? Why did Tsun only carry one bullet in his gun? Why did Tsun declare to Albert, just before he killed him, that "I am your friend"? . . . In the definition of the book, is Albert still alive, just living one of his other lives?

A careful and insightful reader, after reading the story through to the ending, she goes back again to the beginning, a fragment that puzzled

her the first time around: a paragraph that paraphrases *A History of the World War* about the postponement of a planned offensive that seemingly lacked any special significance—a pause that can be accounted for by Yu Tsun's deposition. This entry "takes us nowhere (apparently)," she writes. "After reading the story and a little thought, I decided that maybe the author was implying that the outcome of the battle was inevitable." The Germans survive only to engage in the battle described in the fragment that begins the story because they manage to bomb the British artillery park, and they know the location of the park only once Yu murders Albert and the story makes news headlines. The Germans, however, can connect Albert's name with a valued piece of intelligence—the location of the bomb depot—only if they know that one of their spies has killed him, so Yu must allow himself to be captured—a logical connection this reader cannot quite make, possibly because she sees the story as violating its own precepts. Ts'ui Pên's book, "The Garden of Forking Paths," after all, insists that time exists in an infinite series that embraces "every possibility," as Stephen Albert tells Yu, and Yu agrees with him—even senses phantom versions of the two of them "secretive, busy and multiform in other dimensions of time."[29] So doesn't this mean, this reader demands, that Albert is just living one of his other lives? The relentlessly conclusive spy story is, after all, only one of the many possibilities that exist within the garden of forking paths, the labyrinth created by Ts'ui Pên and rediscovered by both Stephen Albert and Yu Tsun. In the Borges narrative, the garden enables mutually exclusive possibilities to exist simultaneously, and it is the garden that becomes the metaphor for the "Garden of Forking Paths," not Yu's murder of Albert or his own subsequent execution. It seems that the metaphor of the garden, with its plethora of possibilities, invites readers to decide that their own endings to "The Garden of Forking Paths" can assume importance equal to the ending conferred on the narrative by Borges. In this instance, the print readers climbed through the text via a chain of metonymies, exactly as Brooks described, guided by a metaphor that represented the text as a totality—an outcome that makes one realize that, for all the aggravation reading "Forking Paths" caused these readers, Moulthrop was on to a good thing after all.

In the end, we are left with something of a paradox. The readers of the interactive "Forking Paths" seem swamped by a multiplicity of endings and narrative possibilities. The readers of the print story "The Garden of Forking Paths" appear uneasy with Borges's singular and very limited ending to a narrative that concerns itself, nearly to its

penultimate paragraph, with a universe of seemingly infinite possibilities. We can explain the differences in their feelings, perhaps, by taking into account the differences between the media. After all, the hypertext readers were confronted by a text that seemed to blithely transgress every convention, every expectation familiar to them from their excursions in print. On the other hand, the print readers were merely reading a rather problematic print story, hardly a novel experience to undergraduates taking English courses. Yet the group of hypertext readers included one who succeeded in charting a map of the structure of "Forking Paths" and used it to confer meaning upon narrative segments according to their placement within its structural space—hardly the response of a reader overwhelmed by the demands of a new and entirely foreign reading environment.

In fact, the reader of "Forking Paths" who stressed navigation, together with the readers resisting the ending supplied in "The Garden of Forking Paths," seem to have arrived at a definition of closure that revises the usual traditional definitions, where it is generally viewed as both the place where "goals are satisfied, and the protagonist [can] engage in no further action" and the "point at which, without residual expectation, [readers] can experience the structure of the work as, at once, both dynamic and whole"[30] Whereas traditional definitions of closure generally give priority to our grasp of the structure of the work as a whole, these readers seem to have arrived at strong readings that emphasize their sense of the text as part of an ongoing dynamic—a quality that Nancy Kaplan and Stuart Moulthrop first identified in a study of readers of interactive narratives. As one of the readers in their study "Something to Imagine" noted, closure occurs "when we have decided for ourselves that we can put down the story and be content with our interpretation of it. When we feel satisfied that we have gotten enough from the story, then we are complete."[31]

Similarly, all three "strong" readings of "Forking Paths" or "The Garden of Forking Paths" featured what we might call a "reader-centered" dynamic. The reader navigating through the narrative spaces of "Forking Paths" decides, based on his sense of having traversed both the margin and center of the hypertext, that the text will not hand him any great resolutions that might resolve the tensions and possibilities percolating in its plethora of narrative strands. Reflecting back on the dynamic universe of possibilities set up by Ts'ui Pên's Garden of Forking Paths, the readers of "The Garden of Forking Paths" feel that the narrative continues unfolding beyond the singular ending outlined by Borges. "In the definition of the book, is Albert still alive, just living

one of his other lives?" wonders one reader. The other reader, however, perhaps realizing that classmates engaged with the electronic text were experiencing alternate endings to the same narrative episode he encountered, does not simply resist the singular closure of the print story—he invents his own ending:

> I prefer a future in which Tsun [*sic*] murders Richard Madden and lives peaceably with his mentor Dr. Stephen Albert, following in the footsteps of his ancestor Ts'ui Pên and finishing his life work: "The Garden of Forking Paths."

Here it is not simply a case of dealing with two different media environments, since resistant and reader-centered interpretations alike emerged from readings of both the print and hypertext narratives. We appear, instead, to be dealing with two different kinds of readers: what David Riesman, in *The Lonely Crowd*, once dubbed "inner-directed" and "other-directed."[32] Inner-directed readers here are distinguished by their ability to redefine their roles as readers either through discovering a new way of navigating through narrative space or by revising the concept of closure. Other-directed readers, conversely, take their cues for reading from their knowledge of established reading practices and literary conventions, leading them to brand examples of narratives wildly divergent from familiar norms, such as "Forking Paths," as frustrating, nonsensical, and, even, failed.

This distinction between the reactions of inner- and other-directed readers, of course, hardly applies simply to hypertext, just as it does not relegate hypertext fiction to the realms of distinctly highbrow, avant-garde works. Just as we do not expect fiction or novels to belong to some monumental genre, hypertext or hypermedia fiction will likely expand to fit the demands of their audiences: print fiction is not all *The Bridges of Madison County* any more than it is all *Finnegans Wake.* Readers who prefer the neat firmness of endings can already find the pleasures of anticipation and confirmation ticking away in digital narratives like *The Magic Death*—albeit with the nagging realization that, no matter how satisfied they are with an ending, it could always be (and will probably, on further readings, turn out to be) otherwise. No matter how you look at it, closure becomes a handful the moment you remove it from the category of strictly necessary things we cannot choose to do without, like death and digestion. Before hypertext came on the scene, it was a commonly acknowledged

fact that everything had to end, making endings things that were either satisfactory or unsatisfactory but not, in any instance, debatable. Once we dispense with closure as an entity that is always determined by an author and always consumed by a reader, however, we can clear for ourselves a bit of neutral ground to examine what defines an ending beyond the blank space accompanying it.