

Traveling in the Breakdown Lane

A Principle of Resistance for Hypertext

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On-line talent wars will occur: [there will be] a need to keep the lines clean and open.... Above all, perhaps, the author's freedom to take a story anywhere at any time and in as many directions as he or she wishes... becomes the obligation to do so: in the end it can be paralyzing... One will feel the need, even while using these vast networks and principles of randomness and expansive story lines, to struggle against them, just as one now struggles against the linear constraints of the printed book.

--Robert Coover, cited in Landow (112)

In the mid-eighties, more than two decades after Theodor Holm Nelson first broached the subject of "hypertext" or "non-sequential writing" (0/2), computer scientists finally set to work implementing this concept on a broad scale. One of the outcomes of this activity is the World Wide Web, an international system for publishing linked electronic discourse which realizes many aspects of Nelson's great project (Dougherty and Koman 9-13). With tens of thousands of documents and millions of links in place, and more added daily, the World Wide Web may be the most complex written artifact ever produced. As a practical enterprise, not merely a theoretical invention, hypertext has undoubtedly arrived.

As Robert Coover's speculations suggest, this arrival may have as much relevance for fiction, history, and other forms of narrative culture as it does for informatics --though culture workers may well share Coover's deep skepticism. Responses so far have been mixed. After Coover declared "The End of Books" in the *New York Times Book Review* in 1992, hypertext has turned up with surprising frequency in literary discussion. Michiko Kakutani worries that this technology spells the end of responsible writing ("Fiction?" B8), while Nicholson Baker decries "hypertextual bouleversement" as a scare tactic for terrorizing writers and publishers ("Infohighwaymen"). Other commentators have been less agonized. Thomas Pynchon refers casually to "the do-it-yourself hypertextualist" in one of his rare prefaces ("Introduction" xv). Richard Lanham and Jay David Bolter both argue that hypertext merely carries on the ancient project of literacy. For them, the transition from books to electronic webs carries the force of historical necessity. Commenting on Bolter's *Writing Space*, Brian Eno calls Bolter "the new Gutenberg" (12). But electronic culture also has its radical wing --for instance, the "media philosophers" Mark Taylor and Esa Saarinen, for whom hypertext and networked telecommunications represent a new intellectual order. "If you read books," they challenge, "justify it" (*Imagologies*, "Superficiality" 11).

We are asked to understand the future in terms of putative revolutions, ostensibly sweeping changes in the way we make and receive texts. We must now justify what we have done for centuries. But how justifiable is this demand? Where there are utopians there will also be dissidents. One character in Bruce Sterling's

recent novel *Heavy Weather* nicely puts the case against the end of books, surveying the intellectual landscape of a post-apocalyptic 2030:

There were derelicts who could fit all their material possessions in a paper bag, but they'd have a cheap laptop and some big chunk of [the electronic Library of Congress], and they'd crouch under a culvert with it, and peck around on it and fly around in it and hypertext it, and then they'd come up with some pathetic, shattered, crank, loony, paranoid theory as to what the hell had happened to them and their planet. . . . It almost beat drugs for turning smart people into human wreckage. (74)

Whether or not one can justify reading books, or writing hypertexts, the dubiousness of Sterling's narrator seems warranted. As Coover predicts, hypertext confronts us with a troubling paradox. To the extent that it represents any kind of innovation (and the claim is debatable), hypertext departs from the hard line of monology, or what Roland Barthes called the "classic" text (4). According to contemporary theory -- not just the postmodernists and deconstructors, but also response theorists like Ingarden and Iser and dialogists like Bakhtin -- conventional, pre-electronic writing has been moving in this direction for a long time. Writing itself allows us to capture the play of language in artefactual form, opening discourse to reflection and thus to complication. The invention of printing amplified the dissemination of writing, enabling the rise of literary markets and professional authorship. Hypertext might indeed be seen as a direct extension of these trends -- and yet this is where things start to turn paradoxical. Bolter's description of our times as "the late age of print" (2) seems increasingly appropriate. This is an era not of rupture but of transition. Print and its cultural influence are far from dead, though the Gutenberg age has clearly reached a "late" or belated phase. As Harold Bloom teaches, belatedness is an inherently ambiguous condition. One is apt to find oneself "in the father without knowing him" (3), or in some other parental or ancestral relationship, caught in a matrix of tradition even as one seeks to rebel. This might explain Coover's insight, cited in the epigraph, about the crossed purposes of hypertext. New technology promises a swerve from the level line of literary tradition, a venture into strange new worlds of polyvalent, polyvocal form. But this swerve is an ellipse, not an escape. Our outward movement cannot overcome the pull of cultural gravity; so there will be, at some point, a turnabout or return. We will not struggle against the line without also struggling against the web. If hypertext implies change, it also implies resistance. We will not understand either hypertext or the larger cultural developments to which it articulates without coming to terms with this resistance.

1. Resistance and refusal

The desire for a resistance to hypertext is a complicated matter. In other work, Nancy Kaplan and I have examined this effect both as students of the text and teachers of literature. We have noted how the threat of multiplicity in electronic writing tends to turn scholars back to their books, while it confronts students, often more willing to experiment, with a discursive hall of mirrors ("They Became" 233-37). One can choose to resist hypertext the way some conservative critics do, by cleaving to the book and ruling out any engagement with electronic technology. For instance, Alvin Kernan proposes mass microfilming, instead of electronic encoding, to save books from acidic decay, presumably because microfilm preserves the integrity of the book as object (135-36). Words on microfilm stay firmly on the page; they are not permutable as in electronic storage. Kernan's strategy seems misguided, since microfilm is hardly more durable than paper over the long run. Sensible people will see through this error readily enough. Some will of course opt for half-measures like "electronic books" (Yankelovich 134), or "Expanded Books," as the Voyager Company calls its products (Smith 8). But such "expansions" put us on a slippery slope of innovation. Voyager's electronic libraries include facilities for intertextual reference and annotation. Such devices blur and collapse

the boundaries between works, as hypertextual tools tend to do. It is a very small step from the electronic book to true hypertext.

As Kaplan and I have observed in working with students, electronic writing complicates the work of literary criticism. A critical project set up within a hypertextual network becomes an intimate and integral part of the work it tries to anatomize. In its root sense, "criticism" implies a separation of one discourse from another; but in hypertext this primary agenda runs into difficulties. If one chooses to work in hypertext, one has no clear defense against the potential vastness of the network and its principle of multiplicity, if not of "randomness." Resisting hypertext is by no means a simple matter. This does not mean that Coover's prescription is impossible and that we can find no balance between the demands of the network and those of the line. It does suggest that any such accommodation must be deeply ambiguous, so much so that it must turn back upon itself.

But before we can take these insights further, we must first specify what we are resisting. Consider O.B. Hardison's breezy dismissal of hypertext in his last work, *Disappearing through the Skylight*. Hardison speculates about a hypertextual edition of Shakespeare's *Tempest*, presumably an electronic compendium of source texts, commentaries, scholarly apparatus, and recorded performances. Reflecting on this hypothetical object, Hardison wonders: "What does hypertext do for -- or to -- *The Tempest*? Unfortunately, the answer is not as simple as it might seem to be in the abstract. The clear implication of hypertext is that *The Tempest* is not a literary work to be enjoyed but a heap of facts to be memorized or a puzzle to be solved or a mystery to be explained... When we 'read' in this way, the play tends to disappear into the hypertext like water in a sponge" (263-64). This seems a devastating critique, until one realizes that it is aimed at the wrong target. Hardison proposes a modest and uninteresting application of hypertext as typical of all work in the medium -- but this is a serious mistake. His theoretical *Tempest* project represents only incunabular hypertext, a hybrid production that is neither electronic text nor book (nor indeed play) but an uneasy mixture of all these things. In this view Shakespeare's play figures as butterfly in the electronic web, a beautiful captive whose vital juices are sucked out by academic predators. Not all hypertexts, however, put canonical art in such distress.

Throughout Hardison's discussion of electronic technology, his approach seems distinctly pessimistic. Hardison believes that twentieth-century culture enacts a "disappearance" in which nature (whatever that was) is steadily displaced by artefacts. We no longer know things directly, we know only what our machines tell us about them; which is to say, all we really know is our instrumentalities (1). At the end of this process, Hardison predicts, our technologies themselves will disappear in a final act of desertion. He cites a NASA researcher who claims that with "the rapidity of technological evolution, it is reasonable to expect that machines and their descendants only a few thousand years from now might be invisible" (341). That is, advanced information devices will operate in spheres or bandwidths beyond even our technologically extended senses. They will no longer share our ontological level. According to this view, carbon-based life is about to reach the end of its evolutionary program, or the boundaries of its biosphere (for which see again Sterling's eco-crash novel, *Heavy Weather*). The future lies up and out, in the machine-friendly environment of space. The future is, therefore, non-human. *Homo sapiens aliquantum* will be left behind as its erstwhile creations vanish over the "horizon of invisibility," literally disappearing through the sky's light.

It seems logical enough, given this Darwinian fatalism, to regard a development like hypertext as an eruption of noise within a precariously balanced humanist system. But Hardison's narrative of disappearance is by no means the only one applicable. A sharply different view may be found in the work of Manuel De Landa, a technological historian who approaches his subject not like Hardison, as an alienated humanist, but as a researcher well versed in the military-scientific complex. This shift in perspective confers a crucial

difference in understanding. Being an insider, De Landa knows that the course of technological development does not always run true. Seeking to consolidate its own hegemony, militarized science creates powerful devices, from the conoidal bullet to distributed computing networks. But such technologies quite often develop in unintended ways, leading not to the consolidation of power but to its unforeseen dissemination through ad hoc structures (guerrilla armies, or the Internet). Given these possibilities for unforeseen change, De Landa does not foresee a technological overcoming. Quite the reverse: in his view, interactive computing techniques (including hypertext, which he cites specifically) open "the machinic phylum" to human understanding. This is the direct antithesis of Hardison's "disappearance." By using machines to complicate our representation of nature, we make the world around us more richly and deeply present. Interactive graphics enable us to discover the mathematics of chaos, enabling a new understanding of physical structure. By the same token, interactive texts might inspire an exfoliation of language and symbolic imagination. Coover's "vast networks" might not be entirely sinister after all. De Landa sets an important limit on techno-skepticism. "The task confronting us," he concludes, "is to continue the positive tasks begun by hackers and visionary scientists as embodied in their paradigm of human-machine interaction: the personal computer" (228).

Seen from this perspective, hypertext constitutes a much more positive development. But if we follow De Landa's upbeat reasoning, we must define the field of hypertext differently than Hardison does. We must understand hypertext as an encounter with the "machinic phylum." This means separating hypertext incunabula, which do indeed seem to be questionable interventions into book culture, from what we might call native hypertext: productions conceived and developed entirely in the electronic idiom (see my "Informing Texts" 171). Native hypertexts are creative and critical expressions of De Landa's "paradigm of human-machine interaction." They use the interactive attributes of the computer not to routinize understanding, but to augment our potential for inference and expression. Hardison's nightmare of evolutionary bypass stems from a common misprision of computing machines --the old cybernetic dream of electronic brains, or the robot as a replacement for human workers. To a large extent, these dreams are still cherished by proponents of expert systems and the "strong" thesis in artificial intelligence (Penrose 17). But "strong" AI lies in disgrace these days, overtaken by concerns with self-organizing rather than linguistically determined systems, and by a commitment to augmentation rather than autonomous mechanism. The recent interest in hypertext, both in the sciences and the humanities, proceeds from this epistemic shift. H. Van Dyke Parunak, a specialist on the mathematical properties of hypertext, has noted that works in this form "offer semantic richness of data storage comparable to that used in expert systems. In fact, a hyperdocument can be viewed as an expert system whose inference engine is not a computer but a human being" (388). Or to paraphrase, a hypertext is a sort of quasi-AI in which the "I" is you. To some extent this principle is implicit even in Hardison's incunabular hypertext; but it finds fullest expression only in texts that exist independent of book culture -- in writings that come after "the end of books."

2. Constructive resistance

As Coover's epigraph suggests, these native hypertexts are largely (though not always) works of fiction -- and as we will see, this definition should perhaps be understood in two senses: every interactive fiction depends upon a fiction of interaction. In English, the idea of interactive writing goes back at least as far as Sterne, whose Shandean alter-ego claims that "writing, when properly managed... is but a different name for conversation" (108). The application of computers to this eccentric storytelling began with the earliest interactive operating systems. Will Crowther and Don Woods of the Stanford Artificial Intelligence Laboratory programmed the first text-exploration game, the illustrious Adventure, in 1976. Adventure in turn launched a genre (Hardison 265). Its offspring, called "text adventures," became a mainstay of the early

computer game market, with several titles, such as Robert Pinsky and Michael Campbell's *Mindwheel* and Douglas Maretsky's *A Mind Forever Voyaging*, earning literary notice and praise (see Pinsky).

When the current hypertext boom began in the mid-eighties, a number of writers attempted to take interactive fiction beyond the deductive, problem-solving milieu of the text adventures. Michael Joyce's *afternoon: a story* (Eastgate Systems, 1990) introduced a major technical enhancement. Joyce rejected the pragmatic commands found in adventure games ("Go North"; "Take gold"; "Hit troll with ax") in favor of "words that yield:" cues to further development imbedded in the language of the story itself. In an encounter with *afternoon*, the reader may find the sentence: "I want to say I may have seen my son die this morning." If the reader selects the word "son," she follows one narrative direction; if she chooses "die," "I want," or some other set of words, she will go another way entirely. Eastgate Systems, publishers of *afternoon* and Storyspace, the authoring system used to create it, have developed a growing list of hypertext fictions and have just launched the first hypertextual literary review.

Most works of the so-called Eastgate School resemble text adventures by being chiefly verbal; but as word-based hypertext software has given way to more complex "multimedia" tools, interactive fiction has begun to incorporate sounds and images as well. Monica Moran's *Ambulance* (Electronic Hollywood, 1993) brings the aesthetic of "adult comics" to electronic form. John McDaid's *Uncle Buddy's Phantom Funhouse* (Eastgate Systems, 1993) presents the reader with electronic sketchbooks, digital photo-montages, and audio tapes. Greg Roach's *Madness of Roland* (Hyperbole, 1991) combines verbal text and interactive video. None of these fictions make the literary experience "disappear" in Hardison's terms. They do not operate upon any prior, printed work. Though discernible stories do emerge in texts like *afternoon*, *The Ambulance*, and *Uncle Buddy's Phantom Funhouse* -- and though, as we will see, these stories manifest a curious similarity -- the narrative content of the text does not depend upon some authoritative pre-text. Literature does not vanish into the sponge-like electronic network, but rather precipitates on each encounter.

Recognizing the importance of native hypertext might invalidate the harsh resistance of Kernan, Hardison, and other mourners of the book. But dispensing with one misguided form of resistance does not mean we might not find a better one. Coover's injunction to "struggle" seems all the more urgent when applied to native hypertext. In a form of writing that has effectively abandoned singular sequence, Coover's worst fears of "randomness and expansive story lines" would seem to be realized. Native hypertext appears particularly vulnerable to elliptical and anarchic impulses. The problem for writers and readers alike is both to resist and engage its dangerous energies. Coover suggests this accommodation will not be reached without "on-line talent wars"; and indeed the first salvos have already landed. In a recent issue of the *Village Voice*, Erik Davis attacks the "precious literary experiments loved by Robert Coover." Davis prefers a more open, improvisational writing space, one whose inhabitants can "breed narratives of love and war, and jam like improv poets with their chat" (43). This argument was anticipated some months earlier by Espen Aarseth, a noted theorist of computer-based writing, who posted the following on the Technoculture discussion:

I am not convinced hypertext... is a particularly strong example of how "electronic textuality" challenges tradidiological concepts such as readers, authors, freedom (of print/publishing) etc. Significantly, there is very little *free* [hypertext] fiction out there on the net (George [Ladow] making available his students' work seems to be the only exception): the texts we discuss on tnc are written, sold and reviewed (and even canonized) in a very traditional way. Furthermore, their writers are *authors*, with all significant motor-parts intact... Hypertext fictions are novels, both narratologically and sociologically. To find "the new writing" we must look elsewhere; I would suggest towards UseNet, IRC, and the MUDs. (Aarseth)

According to their rhetoric at least, people like Davis and Aarseth are true progressives, not lackeys of reaction. They have little in common with O.B. Hardison beyond a relatively low opinion of hypertext. Aarseth and Davis discount the current generation of electronic writing not because it destroys the traditional experience of literature, but because it seems all too good at maintaining it. This is a form of "struggle against" hypertext which Robert Coover did not foresee.

Aarseth's counterexamples, "UseNet, IRC, and the MUDs," represent alternative possibilities for electronic writing. They share the post-Gutenberg situation of hypertext, though they differ in structure and concept. Unlike the native hypertext discussed above, all three of Aarseth's writing environments operate over the Internet, that vast, self-organizing assemblage of communications systems which might prefigure Mr. Gore's "information superhighway." UseNet supports thousands of "news groups" on which Internet users exchange technical information, cultural opinions, art work, confessions, civic notices, political debate, and even erotica (Krol 238). "IRC" stands for "Internet Relay Chat," a computerized analogue of citizen's band radio in which users exchange typed messages in something close to real time. For our purposes, the most important of Aarseth's alternatives is the third, "the MUDs." The acronym MUD stands among other things for "Multiple User Dimension." Hundreds of such constructs exist around the Internet, including variants called MOO (MUD-Object-Oriented), MUSE (Multiple-User Simulated Environment) and MUSH (where the "H" is for "Hallucination"). Roughly speaking, these creations grow out of the old Adventure game: they are virtual spaces constructed within computer memory, having the same metaphoric spatiality as hypertexts. MUD users move through the space by issuing commands. They may also manipulate objects and (most importantly) conduct transactions with other users (Rheingold 145-75).

Aarseth's comparison of MUDs to the current generation of hypertext fictions seems quite cogent. In many ways, MUDs deliver the same kind of textual experience that hypertexts do. Any engagement with a MUD involves some level of interactive writing, as the user describes actions and receives passages of prose from the program in reply. In addition, the MOOs, MUSEs, and MUSHs allow users to create new spaces, objects, and even simulated persons called "NPCs" or "non-player characters," a term from role-playing games, which are an important source for the MUD subculture. This creative franchise represents a significant difference from the sort of hypertext that we have thus far considered. Works like *afternoon* or *The Madness of Roland* do not allow their readers to change the content or structure of the network -- though it is true that some hypertexts, such as Bolter's electronic version of *Writing Space* and McDaid's *Funhouse*, allow readers to write within the presentation space. Deena Larsen's *Marble Springs* (Eastgate Systems, 1994) invites readers to fill deliberate gaps in its story matrix, promising to include some of these additions in subsequent editions. Even within hypertext, the lines are blurring; but on the whole, literary hypertext keeps the roles of author and reader distinct.

In an important early contribution to hypertext theory, Michael Joyce proposed two different modes of interactive writing: "exploratory" and "constructive" hypertext. Generally speaking, exploratory texts allow readers to navigate through fixed bodies of material, while constructive texts represent "structures for what does not yet exist," open-ended and contingent forms ("Siren Shapes" 10-12). In exploratory hypertext, the distinction between primary author and subsequent reader-explorers remains clear. In constructive hypertext, anyone is free to change the nature of the text. There can be many authors, or perhaps it is more accurate to say that no author retains that status absolutely. This account distorts Joyce's actual argument somewhat. In fact his terms are more continuous than exclusive -- even most commercial hypertexts retain some traces of constructive form. On the other hand, most ventures in open, collaborative electronic writing betray some lingering elements of authorial control; and this realization has considerable bearing on the claims made for MUDs.

The writing environments Aarseth finds most valuable, UseNet newsgroups, Internet Relay Chat lines, and Multiple-User Dimensions, closely resemble Joyce's constructive ideal. In fact, since both news groups and MUDs allow the linking of elements as "threads" or "rooms," they might qualify as constructive hypertexts. Aarseth might also have mentioned other instances of hypertextual writing distributed across the Internet, such as the World Wide Web and Wide Area Information Server, which permit users to create documents whose links span the entire global network (Krol 281-82). When Nelson first described hypertext in the 1960s, he clearly had such constructive schemes in mind, not the limited, exploratory writings that have recently had the limelight. If we remember this, then Aarseth's point seems well taken. The "new writing" cannot have authors in the old-fashioned sense. If hypertext and other forms electronic expression hold out any difference, it would seem to lie with constructive ventures, not such traditional offerings as electronic novels and monographs. The native country of hypertext must be a stranger place than anything we have yet imagined.

If we take constructive hypertext as our ideal, however, how can we construct a principle of resistance? In a writing environment without authors, there would seem to be no check, at least in theory, on what Michel Foucault called the "perilous" spread of discourse. It was to control such an explosion in language that Foucault's "author-function" was called into being (216). If Aarseth is correct in his claim that "the new writing" must be radically non-authoritative and collaborative, then perhaps any struggle against the centrifugal force of hypertext must fail. This would be consistent with the effect Kaplan and I have noticed in our experiments with hypertextual criticism. Perhaps we should simply learn to stop worrying and love the death of the author. Or if we do not wish to surrender so easily, maybe we should redouble our scrutiny of so-called radical electronic writing systems. After all, environments like UseNet, IRC, and the MUDs do have discernible elements of structure. Many UseNet groups, for instance, are managed by moderators who screen incoming material. There are clear conventions for turn-taking, greeting, and departure on Internet Relay Chat. We can even expect some level of coordination, if not deterministic control, in Multi-User Dimensions.

As it happens, Aarseth's claim that MUDs and other Internet spaces represent author-free zones cannot to be taken at face value -- and to be fair, Aarseth offered this opinion not in formal writing but in the spontaneous give-and-take of an electronic debate. The MUDs present many signs of the old authorial Adam. In a recent visit to PMC-MOO, a multi-user space set up by the on-line journal *Postmodern Culture*, one of my colleagues discovered how greatly the demise of authorship has been exaggerated. Within ten minutes of logging on (in a female persona), my informant had encountered sexism, bullying, and even terrorism. First she was accosted by another user who insisted on addressing her as "lady." Reminded that some women find this term objectionable, the user in question replied that "there are only three kinds of females: ladies, babes, and bitches." As this exchange devolved further, the garrulous user abruptly pulled rank, claiming to have "wizard privileges" and then storming off into cyberspace. My informant was initially puzzled by his last remark but soon discovered its meaning. Shortly after the encounter with the digital ladies man, she came across another user claiming to be a "terrorist." This person tossed her a "bomb," which was actually a subprogram that moved her character to an obscure room in the virtual space. She could not leave this room without invoking another subprogram which required special privileges on the system. These privileges are conferred only on "wizards," users who have access to the coding facilities that underlie the MUD.

There would seem to be no fundamental difference between a MUD wizard and the author of an exploratory hypertext. Both exert control over others' movements through a virtual or symbolic space. Both exploit a power gradient within the textual construct. Both represent a response to Coover's dilemma, the necessity to

limit the elliptical spread of networked discourse even as one struggles against the monology of traditional writing. This is not to say that authors and wizards are alike in all respects. There may of course be several wizards in a MUD, just as there can be many authors in a distributed, constructive hypertext. This multiplication of authorship can have important consequences, especially when wizards find their interests in conflict. One wizard of my acquaintance discovered that another programmer had begun to add rooms to "his" MUD, changing the nature of social interactions there. In response he created a self-replicating electronic object named kudzu, which quickly filled all the new rooms -- and unfortunately the old ones as well. The MUD in question became extinct.

Stories such as these shed a revealing light on our engagement with hypertexts, virtual spaces, and other species of electronic writing. They suggest, *pace* Aarseth, that the goal of our literary evolution is not to abolish the author or to amputate her "motor parts." In these new textual environments we may from time to time imagine that the author is "dead" -- long live the author-function, distributed and deconstructed but still very much with us. Our new schemes for writing still invest power in managers of linguistic structure -- albeit a mutable, transient, and contingent sort of power, given to a class of users who do not map neatly onto any old-fashioned *auteur*. Any principle of resistance for hypertext must acknowledge this transformation, which Michael Joyce has recently named "the re-placement of the author." This formulation offers an alternative both to Hardison's attack on hypertext incunabula as the enemy of literature and to Aarseth's dismissal of exploratory hypertext as a form of bourgeois reaction. Hypertext may come after "the end of books" (whatever that means), but it is not quite the revolution that some fear and others crave. Joyce insists that we place the author once again within the text, and that we simultaneously re-place him in a context of difference:

Electronic text can never be completed; at best its closure maps point on point until time is real and the text stays itself, becoming print. But when a point suddenly fails to map onto itself the author is replaced. Replacement of the author turns performer to author. The world intended by the author is a place of encounter where we continually create the future as a dissipative structure: the chance of oriented insertion becomes the moment of structural instability, the interstitial link wherein we enact the replacement of one writing by another. ("Re-Placing the Author")

In discussing the failure of a textual point to map onto itself Joyce draws deeply on topology, dissipative systems, and other critiques of spatial reasoning. It requires much more scope than we have here to do these concepts justice. In fact the re-placement of the author is probably best addressed in artistic practice, not theory. For our present critical purposes, it suffices to note that the moment of replacement involves "structural instability," or to use an idiom from computer science, *breakdown*. The author is placed into a context of incompleteness, stress, and dis-closure. In this context or "place of encounter," the author still operates intentionally, creating a little world, a text or hypertext. But since that world is a performance space, allowing multiple authors as well as readers to occupy the stage, we must understand the author-function within a particular situation -- if not under erasure, then at least in difficulties (see Douglas, "Where the Senses"). It is in this context that we must understand the struggle for and the struggle against the line, which between themselves constitute the dynamic of resistance in hypertext.

But again, practice seems more revealing here than theory. Before we can approach these concepts in the abstract, it is necessary to consider some particulars. Having re-placed the author within electronic writing, it follows that we should glance at least tangentially at what some authors do in that complicated space. This requires a digression.

3. Motor parts

In trying to create a "new foundation" for the art of software design, the cognitive scientists Terry Winograd and Fernando Flores begin with the Heideggerian concept of "thrownness" or contingent being-in-the-moment. The metaphor they use to introduce this concept involves a traffic emergency: they invite the reader to imagine driving along a turnpike in heavy rain and crowded traffic at 55 miles per hour. Into this situation comes a large dog who runs in front of the car. The incident presents a problem in analytical reasoning (it is drawn from a book called *Decision Support Systems*), but it also implies something larger. "This driver," Winograd and Flores note, "is an example par excellence of the thrownness that Heidegger points out in our everyday life. We do not act as a result of consideration, but as a way of being. The driver's reaction in this situation cannot be adequately described in terms of rationality, even bounded rationality. His habits or his experience of a prior accident may be much more important than any of his concepts or evaluations of risk" (145-46). "Thrownness" furnishes a revealing way of thinking about our relation to a world of automated and quasi-autonomous technologies. The driver is indeed the definitive technological citizen. Though we now learn that the "information superhighway" may turn out to be a digital railroad (Lohr), there remains something fundamentally attractive about the earlier metaphor. According to the science fiction writer Pat Cadigan, we are living through the early days of an "Age of Fast Information" (26). We do indeed seem thrown into this fast-paced milieu, without deliberation or option, and with only minimal reaction time once we are up to speed.

We might reasonably suspect that hypertext, as an increasingly popular form of writing on the Internet, is implicated in this Age of Fast Information. Winograd and Flores's high-speed encounter might then tell us something about our experience of hypertext. Indeed, the author of at least one electronic manifesto has already taken up the trope of automotive mayhem. Consider this prologue to the announced *BLAM! Digital CD-ROM Magazine for the Macintosh!!* (Voyager Company, 1994):

These are the end times and we're playing in the streets! But do you know what happens when you play with your back to the traffic? Hint: think quick! BLAM! Are you just going to stand there and get run over? BLAM! is born at the point of impact. You provide the meat, we provide the speed freaks, the motor mavens, the gypsy cab drivers, the habitual drunks, the little old lady from Pasadena, and other regulars on the DMV's most-wanted list. BLAM! will manipulate you into colliding with explosive material. (Swenson)

This is perhaps a good place to stop digressing and return to hypertext and its resistances. There is certainly plenty to resist in the above manifesto. These may be "end times," but some of us learned a long time ago about playing in the street. Many readers, no doubt, will not be pleased with Eric Swenson's desire to run them down, treat them as "meat," or fling explosives, like those bomb-throwing terrorists of the MUDs. Swenson's hyperventilating claims arouse a strong impulse toward criticism in the root sense -- an attempt to cut this discourse off from other, less Sadean approaches to electronic writing. However, such inclinations carry the odor of bad faith. Swenson has one thing dead right: hypertextual writing is indeed "born at the point of impact." Consider this crucial moment in Monica Moran's *Ambulance*:

[In the print version, a graphic from *Ambulance* appears here. Copyright restrictions prevent its use on the Web.]

At this point we might reflect on an insight from McDaid's *Funhouse*, words of wisdom delivered by one of

Uncle Buddy's bandmates: "We have to explore the inner realms of the mind and know how to shoot a good car chase" ("The Writer's Brain," card 115). Car chases tend to involve collisions; and in such scenes, the collisions often multiply. Moran's "instant of demolition" is repeated over and over through much of the current generation of hypertext fiction. We have already noticed the arresting proposition from Michael Joyce's *afternoon*, "I want to say I may have seen my son die this morning." What the narrator means, it develops, is that he has witnessed the aftermath of an encounter much like the one above. Driving to work, he passes the wreck of a gray Buick that looks exactly like his ex-wife's car. There are emergency vehicles on the scene and two covered bodies. Much of the tension that animates *afternoon*, through initial readings at least, flows from this fearsome discovery. Similarly, in *Uncle Buddy's Phantom Funhouse*, one of the documents most deeply concealed within the labyrinthine text is a newspaper clipping about a member of Uncle Buddy's college band who dies when his car skids into a tree. Given its positioning in the text and the way it completes certain patterns in the mosaic of Buddy's life, this event might be crucial to the meaning of the story -- though such judgments are hard to make in a text without an overt narrative. Nonetheless, if the car crash in the *Funhouse* does not hold the key to that particular story, it does seem indicative of an emergent pattern in hypertext writing as a whole. This brief survey might also include a fourth text, J. Yellowlees Douglas's "I Have Said Nothing," which answers the question, "What happens when a Chevy Nova with a 280 engine hits you going 75 miles per hour?"

- It fractures your collarbone, your scapula, your pelvis, your sacral, lumbar, thoracic and cervical vertebrae.
- It splinters your ribcage, compresses your liver, kidneys, spleen, stomach, intestines, lungs and heart.
- It fractures your skull and bruises your brain.
- It causes massive hemorrhaging, throws the heart into cardiac arrest, and throws the central nervous system into profound shock. ("Anatomized")

Since Douglas, McDaid, and Joyce are all inmates of the "Eastgate School," we might explain their obsessions as variations on a theme, or a kind of eastern-urban mass hysteria. However, this rationale will not account for Eric Swenson's interest in the "point of impact" or Monica Moran's attraction to the "moment of impact" -- nor, for that matter, Albert Gore's curious notion that electronic networks can be mapped onto the Interstate Highway System. There seems to be something convergent about these delusions. The particular "thrownness" of which Douglas speaks -- the jolting of the victim into "profound shock" -- might be read less as an obsession and more as a signature of the hypertextual effect. "Profound shock" could describe the conditions from which these texts emerge as well as the effect they address, and perhaps aim to reproduce. Hypertext may be a technology of trauma, reflexively figuring its own assault on the textual corpus in terms of insults to the physical body. Perhaps Sterling's 21st-century cynic is right to call hypertext a stupidity drug for smart people. We might want to say that like speed, hypertext kills. In fact George Landow actually says precisely this when he describes incunabular hypertext. According to Landow, the individual component or "lexia" in such a text "associates with whatever text links to it, thereby dissolving notions of the intellectual separation of one text from others in the way that some chemicals destroy the cell membrane of an organism: destroying the cell membrane destroys the cell: it kills" (53). At least this description has no screeching rubber or high-speed impacts -- but it is not a pretty picture.

If hypertext really "kills" the text, then those who care about literature might justifiably condemn it. And yet the implications of such a position are problematic. Refusing to look at the crash site does not undo the accident. Declining to drive, while a fine civic gesture, cannot really insulate us from the horrors of the

superhighways, electronic or otherwise. After celebrating the death of the traditional text, Landow offers a justification: "destroying now-conventional notions of textual separation may destroy certain attitudes associated with text, but it will not necessarily destroy text. It will, however, reconfigure it and our expectations of it" (53). Whether we like it or not, we must come to terms with this reconfiguration, or in Joyce's terms, the "re-placement of the author." But first we must revise our expectations. Surely no attempt at reconciliation can be wholly successful here. This is why Coover predicts struggle and on-line "wars." There will always be an impulse to reject the violence of the crash, to restore the broken dignity of writing, or to haul the sullied body of the author out of the collaborative MUD. We could dwell on this restorative impulse in its own right, but that is not a very good way to reach a principle of constructive resistance. To move beyond "profound shock" and simple denial, we need to understand that there is something paradoxical about the crash scene. At least on the metaphorical plane, some so-called accidents are not so accidental. By the same token some crashes, though evidently destructive, may actually create new order.

4. Driving in the breakdown lane

To unravel these apparent contradictions, we need once again to invoke the concept of breakdown. Like "thrownness," this idea comes out of Winograd and Flores's encounter with phenomenology. "Following Heidegger," they write, "we prefer to talk about 'breakdowns.' By this we mean the interrupted moment of our habitual, standard, comfortable 'being-in-the-world.' Breakdowns serve an extremely important cognitive function, revealing to us the nature of our practices and equipment, making them 'present-to-hand' to us, perhaps for the first time. In this sense they function in a positive rather than a negative way" (77-78). Winograd and Flores use breakdown as a fulcrum for their efforts to shift the ground of software design. Dismayed by claims of strong-AI proponents such as Roger Schank that computer programs can have actual knowledge, Winograd and Flores point out that understanding cannot be captured in representations and scripts. These structures can never be sufficiently comprehensive. There will always be crucial gaps, leading to moments of failure. "New design," Winograd and Flores argue, "can be created and implemented only in the space that emerges in the recurrent structure of breakdown. A design constitutes an interpretation of breakdown and a committed attempt to anticipate future breakdowns" (78).

Unfortunately, not all designers understand or honor this commitment, which is why Winograd and Flores offer their critique. Drawing not just on phenomenology, but also on the biophysics of Humberto Maturana and the speech-act theory of John Searle, they argue for a deeply contextual view of the world in which structures of meaning spread in an indefinite web of associations --a model, we might note, that recurs in the poststructuralist concept of *le texte*, in De Landa's "machinic phylum," in Nelson's or Landow's descriptions of hypertext, in Joyce's notion of "a structure for what does not yet exist," and in the World Wide Web itself. The complexity of this network defies simple calculation; or to use the idiom of cognitive science, "decision space" has no precise boundaries. Therefore attempts to link cognition to the tools of technology must always encounter (or engender) breakdown. Winograd and Flores cite many instances of this effect, the most striking involving Joseph Weizenbaum's program ELIZA, which mimics the discourse of a psychotherapist. ELIZA does not contain a formal representation of therapeutic knowledge; in essence the program consists of a very clever set of language tricks. Given input of a certain form, ELIZA commonly responds with a simple modification of that input. So when ELIZA encounters a construction of the form, I am [verb phrase], it may respond with the construction, How long have you been [verb phrase]? Herein lies a fatal weakness. One of ELIZA's interlocutors made the claim, "I am swallowing poison" (121). ELIZA's response ("How long have you been swallowing poison?") may represent a fine piece of satire, but the program is supposed to be a therapist, not a satirist. This instance nicely defines the phenomenology of breakdown.

By drawing on breakdown as a criterion for technological design, we may be able to frame a principle of resistance for hypertext. There does seem to be a strong thematic coincidence among the superhighway metaphor, Winograd and Flores's automotive description of "thrownness," and hypertext fiction's obsession with crash scenes. Perhaps these coincidences stem merely from what Thomas Pynchon calls "our front-brain faith in Kute Korrespondences" (*Gravity's Rainbow* 590) -- which is to say, perhaps they are not very meaningful in themselves. Yet they may point symptomatically to a more significant perturbation of the cognitive field. Breakdown seems as good a name as any for this primary disturbance. If we are drawn to images of fast transit and hurtling machinery partly because they represent our not-so-oriented insertion, or our "thrownness" into the Age of Fast Information, then perhaps we should see where the Korrespondences lead. We might theorize that we are obsessed with the image of the crash, particularly in interactive text, because it points to the inevitable outcome of our mad futurity. If Winograd and Flores are right, technology evolves only through the experience of breakdown. There must be Roger Schanks and ELIZAs in the world, and they must make their audacious claims, which must contain serious errors which lead to mortifying practical failures. At the same time, we recognize these errors, coming to understand our technological systems as fundamentally -- even positively -- unreliable.

This last insight might be our principle of resistance. Hypertext fictions are rife with collision, impact, and the scattering of "motor parts" all over the imaginary roadway. Perhaps these images are so pervasive precisely because hypertext fiction enacts and incorporates the principle of breakdown. Much like Weizenbaum's ELIZA, Joyce's *afternoon* or Moran's *Ambulance* or my own *Victory Garden* implicitly claim multiplicity, or at least "a semantic richness of data storage comparable to that found in expert systems." The hypertext pretends to be a mental world made cunningly. In his introduction to *afternoon*, Joyce claims that in his text "we match minds" ("in my mind"). But as Terence Harpold has observed, this putative encounter more often than not turns out to be a mismatch, an instance of wandering or error in the deepest sense (132). Even (or especially) under "re-placement," the hypertext author cannot know how his work will resonate against the particular "thrownness" of a given reader. A reader who chooses the yield word "die" in *afternoon* may be dismayed to find that the connections running through her mind (the die is cast; *Un coup de dés; dies irae*) are not realized at the point of arrival, which simply describes a car wreck. The link in this sense is usually -- or always, at some level of abstraction -- a detour (Harpold 129). No doubt something of this sort happens in conventional writing as well, but books do not entail the same "oriented insertion" as electronic texts. At any and perhaps every interstice in a hypertext, the technological situation opens itself to breakdown. To read these texts is to encounter, in series and at depth, the same deconstruction of authority that takes place between ELIZA and the self-described suicide. The program does not answer our expectations. It violates our sense of commitment, at least to the extent that this is defined in terms of what Joyce calls a "selfish interaction," or an assumption that the story really does exist to please us ("Selfish Interactions" 80-81). Breakdowns always teach us something. In this case we learn that there is an author here after all, and an egotistical and opinionated one at that, making hypertext fiction look like a true shoot off the Shandean tree.

The term "deconstruction" is not used idly here. There is a self-revising double logic inherent in the fiction of interaction that underlies interactive fiction. Its principles may be asserted only under the mark of their own erasure. The author is present but re-placed. The promised but frustrated multiplicity of exploratory hypertext opens inevitably into the seductive possibilities of the Internet and constructive hypertext. Displeased by the backslidings of the Eastgate School, some will sprawl in the MUD's much mire, as Robert Browning might have said. Principles of randomness and infinitely expansive story lines beckon -- and so we come back to the point at which this essay began: Robert Coover's forecast of a contentious future for electronic writing. We have been trying to evolve a resistance which will both endorse and oppose the

essential *promiscuity* of hypertext (taking that term in all its senses). The concept of breakdown seems to help in this, though something more needs to be said about how breakdown may be applied in electronic reading and writing. An initial reader of this essay objected that concentrating on breakdown as a limit to multiplicity slights the "pleasure of the web," or the moment of "precipitation" in which a contingent order manifests itself from the chaos of possibilities, particularly in open-ended texts like *Marble Springs* ("Reader's report"). The point is well taken and must be acknowledged as a serious limit on the claims made here. Hypertextual breakdown should not signify a compromise with the line but a continuation of struggle. The pleasures of the web are real, but they are also fragile.

This fragility -- both the effect and the cause of breakdown -- will always be an enduring feature of the landscape. "Hypertextual story space is now multidimensional and theoretically infinite," Scott Bukatman quotes Coover, finding the remark provocative. "The phrase 'theoretically infinite' raises another question: the lack of closure may be a theoretical strength but a practical weakness. Landow concedes that 'complete hypertextuality requires gigantic information networks' linked more tightly than existing networks. A 'complete' hypertext, like the perfect simulation promised by virtual reality, remains a kind of electronic grail" (Bukatman 13). Like the argument for the "pleasure of the web," this is an important objection. One could adduce *Gravity's Rainbow* as evidence of what happened to grail quests in the sixties, but that would be another story. Suffice it to say that we no longer expect to arrive at the Holy Center, though we may well come in the fullness of time to the Dark Tower or some other scene of success-through-failure. Anyone who understands the ways of native hypertext knows that the point is not to struggle against hypertext. Rather the act of reading in hypertext is constituted *as* struggle: a chapter of chances, a chain of detours, a series of revealing failures in commitment out of which come the pleasures of the text. We must understand hypertext as an information highway in which every lane is reserved for breakdowns, a demolition epic in which the vehicles always and constantly blow apart. Some of us may not be interested in a "complete" hypertext -- indeed certainly not in a "complete" evocation of virtual reality or any other technological "enframing." As Michael Heim pointed out some time ago, we must worry about the tendency toward monolithic drift (or "digital convergence") tending toward "an all-enframing technology... which points to the reduction of the metaphorical powers of language to a single aspect of information management" (72). Give us this day our daily breakdown, rather than such sinister forms of success.

Afterword

In this essay, I owe much to two of my colleagues. In the summer of 1993, Terence Harpold suggested to me that J.G. Ballard's *Crash* might have some bearing on the narrative aesthetics of hypertext. J. Yellowlees Douglas's, "I Have Said Nothing," which I first read that spring, strongly confirmed that insight.

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A note on citation of electronic texts. Elements or "places" in Joyce's *afternoon* and Douglas's "I Have Said Nothing" are not numbered but named, so citations are given by place name. McDaid's *Uncle Buddy's Phantom Funhouse* is organized into named "stacks" which contain a fixed sequence of "cards," and is cited according to that system.

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