

Traveling in the Breakdown Lane: A Principle of Resistance for Hypertext

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In the mid-1980s, more than two decades after Theodor Nelson first broached the subject of “hypertext” or “non-sequential writing” (0/2), computer scientists finally began to implement this concept on a broad scale. Among the outcomes of their work is the World Wide Web, an international electronic publishing system which realizes at least part of Nelson’s vision (Dougherty & Koman 9-13). With millions of documents and tens of millions of links in place—numbers that increase daily—the World Wide Web is *de facto* the most complex textual enterprise in history.

Hypertext has arrived: so definitively, perhaps, that in another five years the concept may have fossilized into cultural bedrock along with the automobile, radio, or the microprocessor itself. Terms like “horseless carriage,” “wireless communication” and “computing machine” seem increasingly quaint the farther we get from their first appearance. Very few people move around chiefly by horse, communicate only over copper wires (phone traffic goes increasingly by laser and microwave), or do complex mathematics in their heads. These technologies have familiarized themselves, passing into that second nature that McLuhan called the *environment* of human invention (53).

It may be, as Jay David Bolter has argued, that hypertext represents a decisive shift in the environment of writing (40). If so, we are probably near the point at which hypertext will no longer provoke much interest. It will simply be the way most writers—of news stories, technical reports, legal documents, business analysis, teaching materials—structure their work. Yet this list omits literature. What about fiction, poetry and drama? This essay will argue that creative writing represents a special and crucially important case, one where the neo-naturalism of writing technologies must necessarily *break down*. McLuhan described artists as a kind of racial antenna system (55). Unlike ordinary people, he believed, artists are sensitive to flaws and

constraints in our second nature or re-invented world. In their engagement with technologies, or “media” as McLuhan called them, artists reveal the medium’s message. They probe the limits of the artificial environment. Though creative writers have only begun to work with hypertext, their early experiments have already produced some important statements, both about this inherently disjunctive medium and the fast-forward culture from which it springs.

The concept of breakdown—which will be given a more technical definition later on—suggests a condition of opposition or difficulty. This certainly seems to be the case in the encounter between hypertext and the literary world, particularly for fiction. To some (perhaps most) in the cultural establishment, hypertext presents a rather daunting problem. Here is Robert Coover’s forecast for hypertextual narrative, from a manuscript cited by Landow (119):

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.

True to Coover’s prediction, the responses to hypertext have so far been mixed. While some struggle gleefully against “the line” (variously defined), others rush to its defense. After Coover declared “The End of Books” in his 1992 commentary in the *New York Times Book Review*, hypertext has turned up with surprising frequency in literary discussion. Michiko Kakutani worries that it spells the end of responsible writing (B8), while Nicholson Baker decries “hypertextual bouleversement” as a scare tactic for terrorizing writers and publishers (25). In his *Gutenberg Elegies*, Sven Birkerts laments the encroachment of hypertext on his “fixed acres of print” (164).

Other responses seem less agonized. A recent issue of the academic trade paper *Lingua Franca* profiles Jerome McGann’s effort to “repossess” literature through electronic media—or vice versa (Johnson 24). Richard Lanham and Jay Bolter have both argued at book-length that hypertext carries on the ancient project of literacy. For them, the transition from books to electronic webs carries the force of historical necessity. These counsels seem to carry some weight, at least among those interested in novelty. Commenting on Bolter’s *Writing Space*, the pop producer and conceptual artist Brian Eno

calls Bolter “the new Gutenberg” (12). As Eno’s remark suggests, there has been even more enthusiasm from the radical wing of contemporary culture. Thomas Pynchon refers casually to “the do-it-yourself hypertextualist” in one of his rare prefaces (“Introduction” xv)—though Pynchon’s novels are of course important hypertextual precursors. The “media philosophers” Mark Taylor and Esa Saarinen think that we should all become hypertextualists. As they see it, 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, sweeping changes in the way we make and receive texts. We must now justify what we have done for centuries. Some (notably Birkerts) find this demand unjustified. They would replace Coover’s forecast of “struggle” with one of decadence and decline. A character in Bruce Sterling’s recent novel *Heavy Weather* puts this case very nicely, 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)

Amateur hypertextualists and “novice paranoids” (as Pynchon elsewhere calls them) should take note.

Whether or not we can justify reading books, or writing hypertexts, a certain amount of doubt seems warranted. As Coover predicts, hypertext confronts us with a paradox. To the extent that it represents any kind of innovation (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—pre-electronic writing has been moving in this direction for a long time. Writing itself allows us to capture the play of language in artifactual 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 era as "the late age of print" (2) seems increasingly accurate. This is a time 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 if this scene seems too patriarchal, in some other ancestral relationship, caught in a matrix of tradition even as one seeks to rebel. New technology promises a swerve from the level line of literary tradition, a venture into strange new worlds of polyvalent, polyvocal form. 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 connects without coming to terms with this resistance.

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. It seems to us that 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 that some conservative critics do, by cleaving to print 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 within the fixed acreage of 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. As an alternative, some may opt for half-measures like "electronic books" (Yankelovich 134), or "Expanded Books," as the Voyager Company calls its products (Smith 8). 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 hypertext 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 literary criticism. A critical project set up inside a hypertextual network (and we must think now of the World Wide Web) becomes an intimate and integral part of the work on which it operates. 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 multiplicity, if not “randomness.” Assuming that one does not simply unplug the machine, resisting hypertext is no simple matter. Yet it does not follow that Coover’s prescription is impossible and that there is no balance between the demands of the network and those of the line. Any such accommodation must be deeply ambiguous, however.

Before we can take these insights farther, we must first know what we are resisting. Consider O. B. Hardison’s breezy dismissal of hypertext in his otherwise brilliant book on late modernism, *Disappearing through the Sky-light*. Hardison conjures up a hypertextual edition of Shakespeare’s *Tempest*, a hypothetical compendium of source texts, commentaries, scholarly apparatus and recorded performances. He 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 takes a rather uninteresting example of hypertext as typical of all work in the medium—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 text figures as butterfly in the electronic web, a beautiful victim whose vitality is sucked out by academic predators. This is regrettable, but also far from universal. Not all hypertexts put canonical art in such distress.

Hardison is largely pessimistic about electronic technology in general. He believes that 20th-century culture enacts a “disappearance” in which nature (whatever that was) is steadily displaced by artifacts. 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 own 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 at scales, speeds, and bandwidths beyond even our technologically extended senses. They will no longer share our ontological level. According to this view, carbon-based life is near the end of its evolutionary program—and

also the limits 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 post-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 the outbreak of noise in an endangered humanist system. Hardison's narrative of disappearance is by no means the only one we might apply, however. 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 brings a crucial difference in understanding. Being an insider, De Landa knows that the course of technological development regularly runs awry. Seeking to consolidate its own hegemony, militarized science creates powerful devices, from the conoidal bullet to distributed computing networks. Such technologies quite often develop in unintended ways, leading not to the consolidation of power but to its unforeseen dissemination through *ad hoc* structures, such as guerrilla armies or the Internet.

Given these possibilities for unforeseen change, De Landa does not predict a technological takeover. Quite the reverse: in his view, interactive computing tools (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 represents a much more positive development. Yet if we follow De Landa's upbeat reasoning, we have to define hypertext differently than Hardison does: as an encounter with the "machinic phylum." This means separating hypertext incunabula, which do indeed seem questionable interventions into book culture, from what we might call *native hypertext*: productions conceived and developed entirely in the electronic idiom. 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 misunderstanding of computing machines—the old cybernetic dream of electronic brains, or the robot as a replacement for human workers. To a large extent, proponents of expert systems and the “strong” thesis in artificial intelligence still cherish this dream (Penrose 17).

“Strong” AI, however, 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 writings that come after “the end of books.”

As Coover suggests, these native hypertexts are mainly (though not always) works of fiction—and as we will see, the term *interactive fiction* should perhaps be understood in two senses: every interactive fiction depends upon a fiction of interaction. In English, the idea of two-way 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, called *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 Maresky's *A Mind Forever Voyaging*, earning literary notice and praise (see Pinsky).

When the current hypertext boom began in the mid-1980s, a number of writers tried to take interactive fiction beyond the deductive, problem-solving milieu of text adventures. Michael Joyce's *afternoon: a story* (originally composed in 1985) 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 readers select the word "son," they move in one narrative direction; if they choose "die," "I want," or some other set of words, they 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 *Eastgate Quarterly Review of Hypertext*, the first journal of hypertext literature.

Most work of the so-called Eastgate School resembles text adventures in that it is 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 esthetic 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 makes 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*, the narrative content of the text does not depend upon some authoritative pre-text. Literature does not vanish into the electronic network, but rather precipitates from it on each reading.

Although this fact might invalidate the hard resistance of Kernan, Hardison, Birkerts, and other mourners of the book, dispensing with one misguided form of resistance does not preclude finding 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" 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 hazardous energies.

Coover suggests that 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 critique was anticipated some months earlier by Espen Aarseth, a theorist of computer-based writing, who posted this message to an Internet discussion group:

I am not convinced hypertext...is a particularly strong example of how "electronic textuality" challenges tradidological [sic] concepts such as readers, authors, freedom (of print/publishing) etc.

Significantly, there is very little *free* [hypertext] fiction out there on the net (George [Landow] 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.

According to their rhetoric at least, people like Davis and Aarseth are progressives, not reactionaries. As avid computer users, they have little in common with Birkerts or Hardison beyond a low opinion of hypertext. Indeed, they would seem to be the true radicals. Aarseth and Davis discount the current generation of electronic writing not because it destroys traditional literature, but because it maintains some of its trappings. This is a form of struggle against hypertext which 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 evolve into an "information super-highway." UseNet supports thousands of "news groups" on which users exchange technical information, cultural opinions, art work, confessions, civic notices, political debate, and less decorous things (Krol 238). "IRC" stands for "Internet Relay Chat," a computerized version of citizen's band radio in which users trade typed messages in something close to real time. For our purposes, the most important of Aarseth's alternatives is "the MUDs." The acronym MUD stands among other things for "Multiple-User Dimension." Thousands 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 *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* (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 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. Nevertheless, most ventures in open, collaborative electronic writing betray some lingering elements of authorial control; and this realization bears importantly on the claims made for MUDs.

The writing environments that Aarseth likes best—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 on the Internet, such as the World Wide Web itself, which permits users to create documents whose links span the entire global network (Krol 281-82). When Nelson first described hypertext

in the 1960s, he argued for the constructive, not the exploratory model. 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 electronic media hold out any difference, it would seem to lie in participatory forms, 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, though, how can we construct a principle of resistance? In a writing environment without authors, there would seem to be no check on what 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 critics should simply stop worrying and love the death of the author. Or if we do not wish to surrender so easily, we might redouble our scrutiny of ostensibly 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 Multiple-User Dimensions.

As it happens, Aarseth's claim that MUDs 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 old-fashioned authorship. 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 quite vividly 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 further degenerated, 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 placed her in 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 underlying 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 need 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 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 introduced a self-replicating electronic kudzu, which quickly filled all the new rooms—and unfortunately the old ones as well. The MUD in question went extinct.

Stories like these shed some light on our engagement with hypertexts, virtual spaces and other kinds of electronic writing. They suggest, *pace* Aarseth, that we may not really want to abolish authors or amputate their "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 with us. Our new schemes for writing continue to 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 the old *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 some fear and others crave. Joyce insists that we place the author once again within the text, and that we simultaneously *re-place* him/her 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")

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 would take more space than we have here to do these concepts justice. In fact the re-placement of the author is probably best addressed in creative writing, not theory. For the 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 disclosure. In this "place of encounter," the author still operates intentionally, creating a little world, his/her text or hypertext. Since that world is a performance space, however, 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 make up the dynamic of resistance in hypertext.

Yet practice seems always more revealing 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 space. This requires a digression.

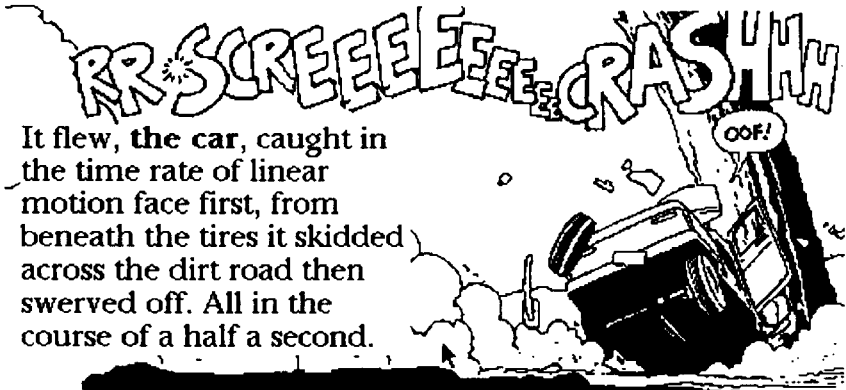
In trying to create a "new foundation" for software design, the cognitive scientists Terry Winograd and Fernando Flores begin with the Heideggerian concept of "thrownness" or contingent being-in-the-moment. The metaphor they use to introduce this concept involves a highway scare: they invite the reader 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—see the interminable buzz about the "information superhighway." 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 frenetic milieu, without deliberation or option, and with only minimal reaction time once we are up to speed.

We might reasonably suspect that hypertext, as a popular form of writing on the Internet, is implicated in this Age of Fast Information. Winograd and Flores's high-speed encounter might thus tell us something about our experience of hypertext. Indeed, at least one electronic manifesto has already taken up the trope of automotive mayhem. Consider this press release by Eric Swenson announcing *BLAM! Digital CD-ROM Magazine for the Macintosh!!*

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.

This is perhaps a good place to stop digressing and resume the subject of hypertext and resistance. There is certainly plenty to resist in the *BLAM!* 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 its root sense—an attempt to separate this rant from other, less Sadean approaches to electronic writing. Yet this response could constitute bad faith. It may be that *BLAM!* and its rhetoric cannot be set apart from hypertext literature. Swenson has one thing dead right: this writing is indeed "born at the point of impact." Consider this crucial moment in Monica Moran's *Ambulance*:



It flew, the car, caught in the time rate of linear motion face first, from beneath the tires it skidded across the dirt road then swerved off. All in the course of a half a second.

At the moment of impact an unusual gravity pulled it toward formless deformation on through the dead shrubbery that had hit them up for one instant of demolition.



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From *Ambulance*. Art © Jaime Hernandez, 1993. Software © Electronic Hollywood, 1993. Story by Monica Moran; Design and Production by Jaime Levy. Reprinted by Permission of Electronic Hollywood

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 seen the aftermath of an encounter much like the one above. Driving to work, he passes the wreck of a gray Buick that looks just like his ex-wife's car. There is an emergency crew 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 Eunhouse* one of the documents deeply concealed in the labyrinth 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 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 unravel that particular story, it does seem indicative of an emergent pattern in hypertext writing generally. This brief survey might also include a fourth text, J. Yellowlees Douglas's "I Have Said Nothing," which answers the terrible 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," their obsessions may simply be variations on a shared theme. Since all three live within a certain proximity of Manhattan, we might put it down just to New York pavement hysteria. By the same token, maybe Eric Swenson's *Blam!* mentality and Monica Moran's obsession with the point of impact stem from similar urban anxieties mirrored on the west coast. Why, however, do these fears seem so compelling and revealing in our Age of Fast Information?

Perhaps this trope is not so trivial. The particular "thrownness" of which Douglas speaks—the jolting of the victim into "profound shock"—might be read as a signature of the hypertextual effect. "Profound shock" could describe the conditions from which these texts emerge as well as the effect they may have on certain critics. Perhaps hypertext is a technology of trauma, reflexively figuring its own assault on the textual corpus in terms of insults to the physical body. Sterling's 21st-century cynic may be right to compare hypertext to certain drugs: like speed (in both senses), hypertext kills. In fact Landow actually says exactly this in a description of 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).

If hypertext really "kills" the text, then those who care about literature can justifiably condemn it—unless this hit-and-run murder of the text is not the whole story. Simply condemning hypertext, or retreating into crotchety

bibliomania, raises certain problems. 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 superhighway, 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."

First, however, we will need to revise our expectations. Surely no attempt at reconciliation can be wholly successful here. This is why Coover predicts struggle and warfare. 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 from 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 metaphorically speaking, some so-called accidents are not so accidental. By the same token some crashes, though evidently destructive, may actually create new order.

To unravel these apparent contradictions, we need once again to invoke the concept of breakdown. Like "throwness," 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 conceptual fulcrum in 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. Drawing not just on phenomenology, but also on the biophysics of Humberto Maturana and the speech-act theory of John Searle, Winograd and Flores argue for a deeply contextual view of the world in which structures of meaning weave 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 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 be a fine piece of satire, but the program is supposed to be a therapist, not a satirist. This case nicely defines the phenomenology of breakdown.

By drawing on breakdown as a criterion for technological design, we may finally 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 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, they may not be 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 that "Korrespondence" leads. We might theorize that we are obsessed with the image of the crash, particularly in interactive text, because it tells us something deeply important about 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 and thus lead to mortifying failures. At the same time, we recognize these errors, coming to understand our technological systems as fundamentally—even *positively*—unreliable.

In this last insight lies our principle of resistance. Hypertext fictions are rife with collision, impact and the scattering of “motor parts” all over the roadway. Perhaps these images are so pervasive precisely because *hypertext fiction enacts and incorporates the principle of breakdown*. Much like Weizenbaum’s ELIZA, works like Joyce’s *afternoon*, Moran’s *Ambulance* and 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”). As Terence Harpold has observed, however, this putative encounter more often than not turns into a mismatch, an instance of wandering or error in the deepest sense (132).

Under “re-placement,” the hypertext author cannot know how his work will resonate against the particular “thrownness” of a given reader. Readers who choose the yield word “die” in *afternoon* may be dismayed to find that the connections running through their minds (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 also, but books do not involve 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” 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 branch 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 expansive story lines beckon—and so we come back to the point at which this discussion began: 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—its tendency to *mix things up*. The concept of breakdown seems to help in this, though much more needs to be said about how breakdown may be applied in electronic reading and writing. It might be objected that concentrating on breakdown as a limit to multiplicity slights the legitimate pleasures of the web, moments when a contingent order manifests itself from the chaos of possibilities. The point is well taken. Hypertextual breakdown should not signify a compromise with the line but a continuation of struggle. The pleasures of the web are real. They are also fragile.

This fragility—both the effect and the cause of breakdown—seems to be an enduring feature of the landscape. Scott Bukatman quotes Coover to the effect that “[h]ypertextual story space is now multidimensional and theoretically infinite.” Bukatman finds the remark provocative. “The phrase ‘theoretically infinite’ raises another question,” he notes. “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” (13). Like the argument for pleasure in the web, this is an important objection.

One could adduce *Gravity’s Rainbow* as evidence of what happened to grail quests in the 1960s, but that would be another story. Suffice it to say that we no longer expect to arrive at a Holy Center, though we may 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 web, or the text. We must understand hypertext as an information highway where every lane is reserved for breakdowns, a demolition epic in which the vehicles continually come 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 P. Michael Heim pointed out some time ago, we must worry about a monolithic drift 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 any such sinister success.*

* In my thinking in this essay I owe debts to three colleagues. In the spring of 1993, I read J. Yellowlees Douglas's fiction, "I Have Said Nothing," which started me thinking about crash esthetics in hypertext. That summer, Terence Harpold suggested in correspondence that J. G. Ballard's *Crash* might have some bearing on hypertext fiction. Espen Aarseth's "motor parts" remark, coming shortly afterward, stimulated me to put it all together.

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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 references 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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