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Is this hypertext any good? Evaluating quality in hypermedia

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Abstract

What is quality in hypertext? How, in other words, do we judge a hypertext collection of documents (or web) to be successful or unsuccessful, to be good or bad as hypertext? How can we judge if a particular hypertext achieves elegance or just mediocrity? Those questions lead to another: what in particular is good about hypertext? To answer these questions this paper proposes a number of basic rules, including (1) Individual lexias should have an adequate number of links, (2) Following links should provide a satisfying experience, (3) The pleasure of following links comes from a perception of coherence, (4) such coherence can take the form of analogy, (5) Individual lexias should satisfy readers and yet prompt them to want to follow additional links, (6) The document should exemplify true hypertextuality by providing multiple lines of organization, and (7) hyper-document should fully engage the hypertextual capacities of the particular software environment employed.
The paper also asks if (1) hypertext has a characteristic or necessary form of metaphoric organization? (2) how important are gaps between documents to successful hypertext? (3) What is the relation between animated text and hypertext.

What is quality in hypertext? How, in other words, do we judge a hypertext collection of documents (or web) to be successful or unsuccessful, to be good or bad as hypertext? How can we judge if a particular hypertext achieves elegance or just mediocrity? Those questions lead to another: what in particular is good about hypertext? What qualities does hypertext have in addition to those possessed by non-hypertextual forms of writing, which at their best can boast clarity, energy, rhythm, force, complexity, and nuance? What qualities, in other words, derive from a form of writing that is defined to a large extent by electronic linking. What good things, what desirable qualities, come with linking, since the link is the defining characteristic of hypertext? As I have argued elsewhere, the defining qualities of the medium include multilinearity, consequent potential multivocality, conceptual richness, and —especially where informational hypertext is concerned— reader

centeredness or control by the reader (*Hypertext 2.0*, pp. 33-48). Obviously, works in a hypertext environment that fulfill some or all of these potential qualities exemplify quality in hypermedia. Are there other perhaps less obvious sources of quality?

Before we can consider answering such a large question, or set ofquestions, we must first distinguish between informational and educational hypertext on the one hand and fictional and poetic hypertext on the other. The first and chief reason for doing so involves the concept of disorientation, which fictional and poetic texts often employ as part of their central project, but which appears only as an error – as a result of poor writing – in nonfictional hyperwebs. One question we must raise while trying to identify sources of quality in hypermedia is, to what extent do literary and informational hypermedia differ? In the following pages, I shall propose several possible ways to an answer these questions, each of which itself involves a central issue involving this information technology.

Individual lexias should have an adequate number of links

Since the link is the characteristic feature that defines hypertextuality, one naturally assumes that lexias containing a larger number of valuable links are better than those that have fewer. Of course, the emphasis here must be upon "valuable." In the early days of the Web, one would often come upon personal homepages in which virtually every word other than the articles "the," "a," and "an" had links, many of which led to external sites only generally connected to the discussion at hand. Obviously, overlinking, like choosing poor link destinations, is bad linking. As Peter Brusilovsky and Riccardo Rizzo have pointed out in " Map-Based Horizontal Navigation in Educational Hypertext" (2002), the opposite problem — a lack of linking precisely in those places one would expect it to appear — characterizes much recent WWW hypertext. Part of the problem here may come directly from the WWW's use of unsuitable terminology derived from print technology, such as "homepage," which locks neophyte users into an inappropriate paradigm. Brusilovsky and Rizzo correctly note, much hypertext today takes the form of passages of unlinked text surrounded by navigation links. Encountering these kind of lexias, one receives the impression that the authors, who have dropped digitized versions of printed pages into an electronic environment, don't seem to grasp the defining qualities of hypermedia and use html chiefly as a text formatting system.

The *Victorian Web* (victorianweb.org), an academic site I manage that receives as many as fifteen million hits a month, contains four basic kinds of documents: (1)

overviews (sitemaps), (2) link lists, (3) simple two-column tables used primarily for art works and text describing them, and, finally, (4) lexias containing primarily text, though some may also include thumbnail images linked to larger plates. Most text documents contain two to four navigation links in the form of linked icons that appear at the bottom of each lexia plus multiple text links that weave the lexia into a miniature hypertext network. Although I find myself unable to formulate any rule as to proper number of text links, I have observed two things: (1) lexias approximately one to two screens in length tend to have at least three text links, and (2) as new documents arrive, older lexias receive additional links.

The comparative lack of text links observed in much web-based hypermedia also appears in much hyperfiction, as many authors seem uninterested in using more than single links, which create an essentially linear flow. Caitlin Fisher's *Waves of Girls*, a web narrative that won the 2003 ELO prize for electronic fiction, exemplifies the comparatively rare literary hypertext that includes both framing navigational links and others in the body of the text. Thus, in the following brief example, the phrases "I was so sad", "our principal", "grade 5 boys . . .", "making out really meant . . ." all lead to — that is, produce — new text.
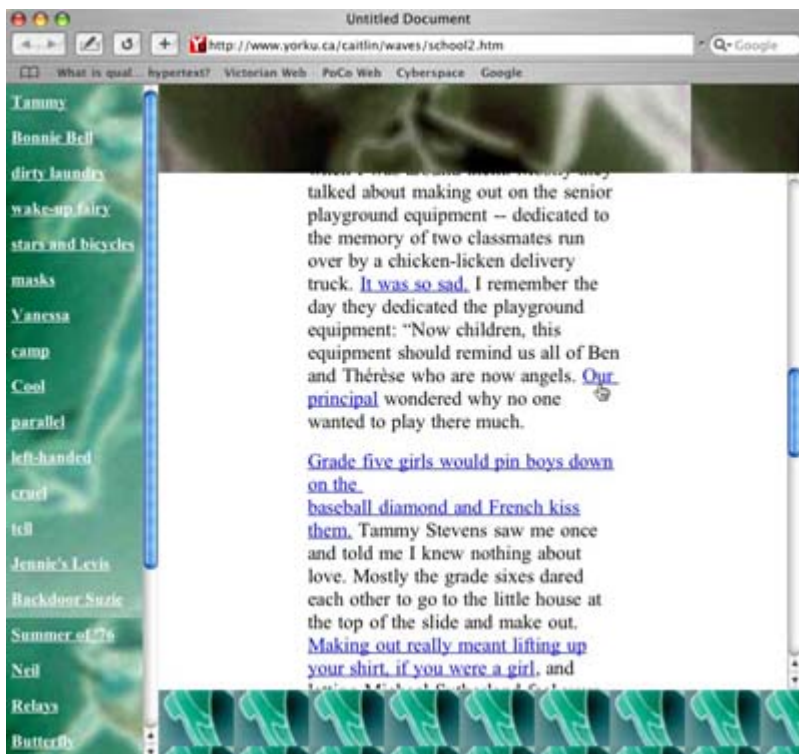
In addition to the navigation links that appear at the left of the screen, the main text also contains frequent opportunities to follow links, which lead to other narrative arcs.

Following the link should provide a satisfying experience

Linking in informational hypermedia obviously has to work in a clear, coherent manner, but what produces this requisite coherence? In other words, what should appear at the end of a link to satisfy the intellectual and aesthetic needs of the reader?[1] Let's take as an example what happens when one comes upon linked text in the midst of the following sentence in a lexia from the *Victorian Web* about the prose fantasies of William Morris: "Like John Ruskin, Morris creates prose fantasies permeated by his beliefs about political economics." What should one find at the end of the link attached to the name "John Ruskin"? For the reader of the present lexia, which discusses fantastic literature by Morris, the most useful link would produce a discussion of fantastic fiction by Ruskin, and in fact the *Victorian Web* has such a relevant document, "John Ruskin and the Literary Fairy Tale," one section of which explains the relations of his early fantasy to his later political writings. One might even hope that such a link would even bring one to a comparison of the distinctive qualities of each author's writings in this mode, which this existing document does not. All these desired link-destinations, one notes, are implied by the wording of the sentence in which the linked text appears.

What happens, however, when such discussions are unavailable? What usually happens both in the websites I've examined and those I manage is that the link of the compared author – here Ruskin – goes to very basic or general information about that figure. Notice that such a link to general information, which may provide a kind of basic identification of the figure for neophytes in the field, is not necessarily a bad link. In fact, for certain users, particularly those new to a particularly field or subject, such a link destination might prove very useful. Still, most users of documents about quite specific topics require information that directly illuminates the main subject at hand (in this case, Ruskin's fairy tale). The fact is, though , that such specific link destinations are far more rare than the more general, glossary-type ones.

Obviously, one would prefer to give readers a choice of information, in this case providing both general and very specific information, in part because such a choice offers a richer, more user-centered embodiment of hypertextuality. Unfortunately, the WWW, which at present allows only links from a word or phrase to a single

destination, does not offer one of the most useful kinds of linking – the one-to-many or branching link that offers the reader a choice of destinations at the point of departure (see *Hypertext 2.0*, pp. 12-14). One solution is to link the anchor –here "John Ruskin"– to another document, which has to be manually created, that offers multiple choices. Depending on the subject of the lexia in which this name appears, the link list or area sitemap at the end of such a link can take the form of lists of links to biographical information about "John Ruskin," those leading to his influence upon various authors, and so on. Another approach to handling links to several destinations, not always possible to implement, requires adding phrases that might provide multiple anchors in the departure sentence. Thus, one could link general information to the figure's name (John Ruskin) and specific information only to phrases, such as "permeated by his beliefs," that lead the reader to expect a very specific discussion at the destination lexia.

The pleasures of following links in hyperfiction and poetry

Since much hyperfiction and poetry aims to produce reader disorientation, however transient, the informational hypertext features of reader empowerment, multiple approaches, and clarity might not appear particularly important to it. Instead, the qualities of surprise and delight characterize such success, for with hyperfiction and poetry the question must be, not does following the link chiefly satisfy an intellectual need but does following the link produce surprise and delight? Instances of such pleasing results of following links appear Stephanie Strickland's *Vniverse* and Ian M. Lyons' *(box(ing))*, both of which produce text *ex nihilio*. When one moves one's mouse over a predetermined area (near a parenthesis in *(box(ing)*) and within the night sky in *Vniverse*) and then clicks, text appears.[2] Thus, when the reader opens *(box(ing))*, little appears on the screen other than a multiple gray parentheses scattered across the a white background.

Lyons explains, "The placing of the parentheses" was intended to "convey nested levels of associative meaning . . . arranged hierarchically; that is, if I opened one parenthetic set and then opened a second, this second set I always made to close before the first. For example: (1 ... (2 ...)2 ...)1." Lyons explains that "the piece's parenthetically obsessive syntax closely resembles that used in the entirely outmoded programming language, LisP (more recently reincarnated under the name Scheme)." Clicking on the screen within some parentheses and outside others incrementally produces text. Lyon's poem, which he implemented in html, Storyspace, and Visual basic, was, he tells us, originally written to be read on paper with the intention of questioning "hierarchical modes of organization" found in post-

Chomskian linguistics and implicitly confounded by hypertext, since, as Nelson has pointed out, the shortcomings of classification systems, all of which require hierarchies, explain the need of hypermedia in the first place.[3] The pleasures of reading *(box(ing))*, I propose, come from the discoveries of text the reader produces and of the meanings of that quite difficult text.

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        (                        )
   (  ))                          )
                )(
        (                   (again (history ends)
                            ) (some thing in
              (             the lines (could (not) be real (endless
              (             really) lines) is needing (
   ))) (                          (of course))) (always forward (
        (                ))
 )(  (        )    (        the always method (building
      (            (        blocks built in lines)) nature(s)
                   (        ( )evolves (to better box)) (park
   )))) (                   (city (headlong (one millions (
            (               )) straight on (and on)) walls
               (            around) is (not sur-)round (even
               (
box(   )(                 ( pavement cracks are flat (
    (      )        (       good foundation) and angles (tall
  ))))))))                   sophist(icated) (methods for i (
(                                 (econo cyclo schemes)
    (box(  )                      (you)) to quickerbetter i) hard eyes))
  )              (          with weeds fingering out) (so
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                                             (powernature
                            powered down
                            to powerhuman (

                                  ))) (persistent
                            power sprouts (powerlearn))

                            )(fuck (powerfuck) power (just live
                            forever (the cancer (the infinite cell
                            ) as the fountain (
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Stephanie Strickland's *Vniverse*, a much more complex project than *(box(ing))*, represents a comparatively rare example of literary hypermedia that aims both at producing delighted surprise and the virtues associated with information hypermedia —reader empowerment and multivocality, or multiple approaches to a single general subject. [4]

Upon opening *Vniverse*, one encounters a night sky —a black screen speckled with stars— in which the central portion rotates. A small circle appears at top right and a slightly smaller one appears diagonally opposite at lower left. Moving one's mouse across the sky produces halts the rotation and reveals various constellations. Meanwhile instructions scroll across the bottom of the screen: "Scan the stars . . . click once or click twice . . . click the darkness." Clicking on darkness brings forth a constellation, a particular star with its assigned number, and text that appears when

one keeps one's mouse over the point at which one clicked. Typing a number in the top right hand circle produces the star with that number and its surrounding constellation. Like many hypermedia projects that employ Flash and similar software, *Vniverse* boasts animated text. Unlike many such projects, it also emphasizes a high degree of reader control.

Coherence

Rich linking, plus a substantial degree of reader control, thus appear to characterize success in both informational and literary hypermedia. Another necessary quality, I propose, is some sort of crucial coherence.

Since hypertext fiction and poetry often employ disorientation effects for aesthetic purposes, coherent and relevant linking might not seem to be necessary, but I suspect it's simply that coherence not take as obvious forms as it does in information hypermedia. For example, our experience of reading pioneering hyperfiction, such as Michael Joyce's *afternoon*, proves definitively that much of what we have assumed about the relations of coherence to textuality, fixed sequence, and the act of reading as sense-making is simply false. Reading *afternoon* and other fictional narratives shows, in other words, that we can make sense of —that is, perceive as coherent— a group of lexias even when we encounter them in varying order. This inherent human ability to construct meanings out of the

kind of discrete blocks of text found in an assemblage of linked lexias does not imply either that text can (or should) be entirely random, or that coherence, relevance, and multiplicity do not contribute to the pleasures of hypertext reading. Movement in *afternoon* from a lexia containing, say, the conversation of two men to one containing that of one of their wives may at first appear abrupt (and hence random or without any relevance), but continued reading establishes the essential coherence of the link between the two lexias: the movement between the one containing the men speaking and the second containing the women can be repeated, thus establishing a pattern like cinematic cross-cutting. Similarly, the next lexia one encounters can reveal that the words of one pair of speakers serve as the context, the backstory, for the others.[5]

Coherence as perceived analogy

In linking, this necessary coherence can also take the form of perceived analogy — that is, the link, the jump across the textual gap, to some extent reifies the implied connection (implied link) found in allusions, similes, and metaphors. For an example, let us look at another early Storyspace narrative, Joshua Rappaport's *Hero's Face*, which shows how linking can serve as a new form of textual allusion. In *Hero's Face*, which relates the struggles for musical supremacy in a rock band, one particular link transports one from adolescent Rock and Roll to an entirely different, and very unexpected, world of ancient epic. Most of the story consists of lexias about the people in the band and the relationships among them. In one crucial lexia the narrator describes the first time he "climbed serious lead" —seized control of the music in mid-performance— and realized that the experience resembles the feelings he has had while mountain climbing: "There comes a moment when all of a sudden you look behind you and you're out eight or ten feet from your last piece, which adds up to a twenty-foot fall onto the dubious support of some quickly-wedged chunk of metal in a crack— you look behind you, and it's just straight down, eighty or a hundred feet, and your belayer barely visible there at the bottom waiting for you to peel off — every muscle pumped up to bursting, as you realize that it is the mere strength of fingers and arms and your innate sense of balance keeping you up in the air." After readers encounter this comparison of musical improvisation to mountaineering, they come upon a link that functions as a second analogy, for following this link brings one to the world of the Finnish epic, the *Kalelava*:

> The old Vainamoinen sang:
> the lakes rippled, the earth shook
> the copper mountains trembled
> the sturdy boulders rumbled

> the cliffs flew in two
> the rocks cracked upon the shores.
> He sang young Joukahainen—
> saplings on his collar-bow
> a willow shrub on his hames
> goat willows on his trace-tip
> sang his gold-trimmed sleigh
> sang it to treetrunks in pools
> sang his whip knotted with beads
> to reeds on a shore

Following Rappaport's link has several effects. First, readers find themselves in a different, more heroic age of gods and myth, and then, as they realize that the gods are engaged in a musical contest that parallels the rock group's, they also see that the contemporary action resonates with the ancient one, thereby acquiring greater significance since it now appears epic and archetypal. This single link in *Hero's Face*, in other words, functions as a new form of both allusion and recontextualization.
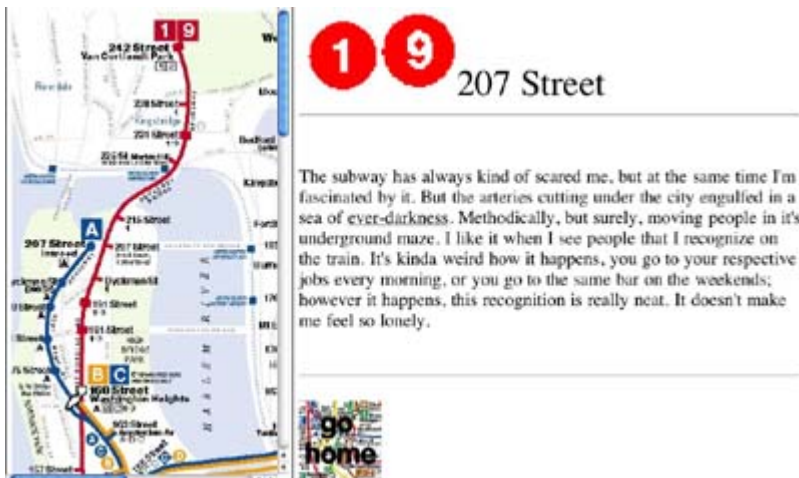
In hyperfiction, Michael Joyce invented this form of reified comparison or allusion when he has links transport readers from his story to passages from Plato's *Phaedo*, Vico's *New Science*, Basho's *The Narrow Road through the Provinces*, and poems by Robert Creeley and others. Perhaps the ultimate source here is Julio Cortazar's *Hopscotch* (to which Joyce alludes in the lexia entitled "Hop Scotch"). Frequently used, such juxtapositions-by-linking produce the kind of collage writing that appears to be very typical of hyperfiction and poetry.[6]

Such combinations of literary homage to a predecessor text and claims to rival it have been a part of literature in the West at least since the ancient Greeks. But the physical separation between texts characteristic of earlier, non-electronic information technologies required that their forms of linking —allusion and contextualization — employ indicators within the text, such as verbal echoing or the elaborate use of parallel structural patterns (such as invocations or catalogues). Hypertext, which permits authors to use traditional methods, also permits them to create these effects simply by connecting texts. When successful, such linking-as-allusion creates a pleasurable shock of recognition as the reader's understanding of the fictional world suddenly shifts.

Does hypertext have a characteristic or necessary form of metaphoric organization?

The creation of coherence in linking via implied analogy can characterize not just the relation between two lexias but also an entire hypertext. The kind of textuality created by linking encourages certain forms of metaphor and analogy that help organize the reader's experience in a pleasurable way. Some of the most successful hyperfictions, such as Shelley Jackson's *Patchwork Girl*, employ the powerful organizing motifs of as scars and stitching together that function as commentaries upon gender, identity, and hypertextuality. Stitches and scars, which have obvious relevance in a tale involving Dr. Frankenstein and one of his monsters, become metaphorical and create unity and coherence for the entire assemblage of lexias. At an early crux in the narrative ("Sight"), Jackson creates a branching point at which the reader must choose between two lexias, both of which emphasize the analogous relationships among writing, reading a hypertext, and sewing up a monster ("written," "sewn"). Jackson's witty plays on these topics all play a role in a hyperfiction that exposes the way we create and experience texts, hypertexts, gender, and identity.

One can also create unifying metaphors or analogies that do not refer to hypertext, the medium itself. David Yun's *Subway Story* is a work of hyperfiction that employs metaphors that inform the narrative in "non-reflexive" modes. *Subway Story*, which employs the organizational metaphor of the map for the New York subway system: it includes both a map of that system and a lexia for each of its stations.

Yun has created a lexia for every stop on the subway, and he has used the paths of the individual trains as link paths that create narrative arcs. As Stefanie Panke pointed out to me when I asked her why she thought it an example of good hypertext fiction: "*Subway Story* is an extraordinary hypertext because of the application of a spatial metaphor that allows a navigation that is somehow 'linked' to the story itself. It is a beautiful example for a metaphor that works because it is a part of (and not apart from) the story-telling."

Gaps

As should be obvious by now, good hypertext –quality in hypertext– depends not only upon appropriate and effective links but also upon appropriate and effective breaks or gaps between and among lexias. Terence Harpold long ago pointed out that Derridean gaps, the presence of which requires linking in the first place, have just as much importance in hypertext as do links themselves. Without good –by which I mean effective and appropriate– separations one cannot have good links. Like the epic hero who requires an adequate antagonist to demonstrate his superiority, linking requires a suitable gap that must be bridged. We have all read hypertexts in which following a link produces a text that seems to follow what came before in such obvious sequence, the reader wonders why the author simply didn't join the two. We've all encountered relatively poor or ineffectual gaps by which I mean those breaks in an apparently linear text that appear arbitrary: the gap, the division between two texts, appears unnecessary when the link does nothing more than put back together two passages that belong together when no other paths are possible.

Hyperfiction and poetry can have two very different kinds of gaps, the first being those bridged or surmounted by links, the second those that remain, well, gaps because nothing in the software environment joins the two texts or lexias. Whereas the first kind of gap, that joined by links, seems obvious because we encounter it every time we follow a link, the other is not. As an example of the second I am thinking entire sections or narrative arcs in works like *Patchwork Girl* that remain separate and separated in the reader's experience and yet may be joined by allusion or thematic parallels. Thus, in *Patchwork Girl* gatherings of lexias about the stitched-together nature of the female Frankenstein monster reside in a different folder or directory than those comprising Shelley Jackson's collage lexias composed of various texts from Jacques Derrida, L. Frank Baum, and Mary Shelley. These discrete sections join in variations on the themes of text, stitched-together-ness, coherence, origins, and identity.
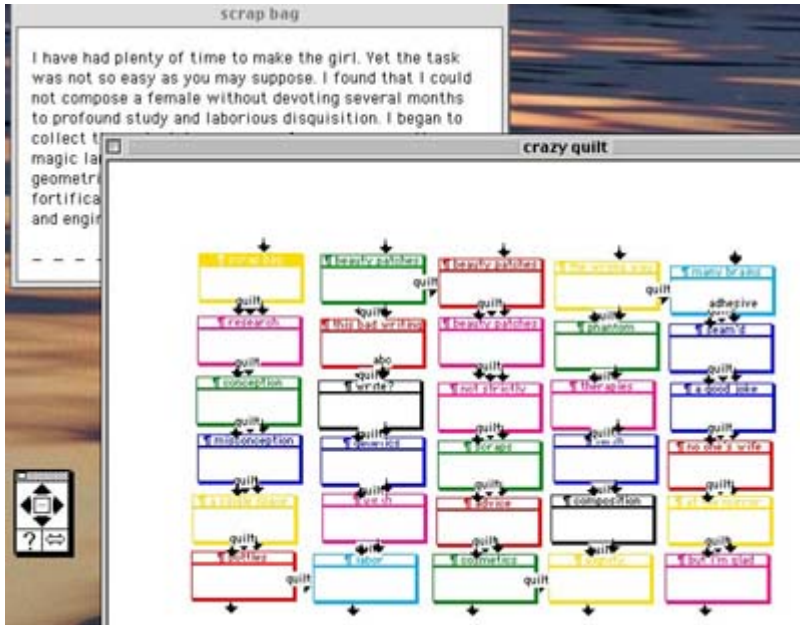
As this example of gaps unjoined by links makes clear, not all connections in effective hypertext require electronic connections – like non-hypertextual prose and poetry, hypertext also makes use of allusions, metaphors, and implicit parallels. The real question turns out to be, then, how does one decide when to make the potential connection, relation, or parallel explicit by means of an electronic link and when to leave connections, relations, or parallels implicit?

Individual lexias should satisfy readers and yet prompt them to want to follow additional links

Hypertext is after all still text, still writing, and we find difficult distinguishing many of the qualities of other good writing from writing with links. In other words, excellence in hypertext does not depend solely upon the link. To an important extent, the text that surrounds the link matters, too, because the quality of writing and images within an individual lexia relates to one key hypertextual quality –its ability to make the reader simultaneously satisfied enough with the contents of a particular lexia to want to follow a link from that lexia to another. The problem that any writer faces –whether the writer of hyperfiction or of stories intended for print– can be defined simply as how to keep the reader reading. Making readers want to continue

reading seems much easier in print text for a variety of reasons: knowing the genre signals, readers know what to expect; looking at their place in a physical text, they know how much more they have to read; without choices demanded by linking, readers have essentially one choice – to continue reading or to put down the story, novel, or poem.

Particularly in these early days of the history of these new technologies and associated media, readers have a more difficult time deciding whether to keep reading. The text they read must persuade them to go on by the essential, traditional, convention means –that is, by intriguing, tantalizing, satisfying, and above all entertaining them. In a hypertext lexia the reader must encounter text that is simultaneously, perhaps paradoxically, both satisfying and just unsatisfying enough: in other words, the current lexia readers encounter has to have enough interest, like any text, to convince them to keep reading, and yet at the same time it must also leave enough questions unanswered that reader feels driven to follow links in order to continue reading. In the terms of Roland Barthes, the lexia must include sufficient plot enigmas or hermeneutic codes to drive the reader forward. This demand explains why the opening lexia of Michael Joyce's classic *afternoon*, perhaps the first and still one of the most interesting hyperfictions, takes the form of such ornate metaphorical prose. Here, for example, is the second paragraph in *afternoon's* opening lexia ("begin"):

> "octopi and palms of ice — rivers and continents beset by fear, and we walk out to the car, the snow moaning beneath our boots and the oaks exploding in a series along the fenceline on the horizon, the shrapnel settling like relics, the echoing thundering off far ice. This was the essence of wood, these fragments say. And this darkness is air. By five the sun sets and the afternoon melt freezes again across the blacktop into crystal"

The rich, sensual metaphoric style of this lexia promises reader a lush reading experience and therefore makes them want to keep reading, but this section is also self-contained enough to cohere as a separate lexia. As anyone who has read *afternoon* knows, not all its lexias have this richness — some are quite bare and brief — but he does employ this style elsewhere, for example, in "Staghorn and starthistle."

The reader can easily locate and move to a sitemap, introduction, or other starting point

Can the reader easily return to documents or images encountered in previous session? Such a requirement obviously pertains more to informational or discursive

hypertext than to hyperfiction or poetry, though some fictions, such as Jackie Craven's *In the Changing Room*, employs a sitemap consisting of the names of each of eight characters.

Whereas Craven's sitemap takes the form of a typical html set of labeled links, Deena Larsen's *Stained Word Window* (1999) uses an active (or "hot") sitemap at screen left (on a black background) to bring up text at the right.
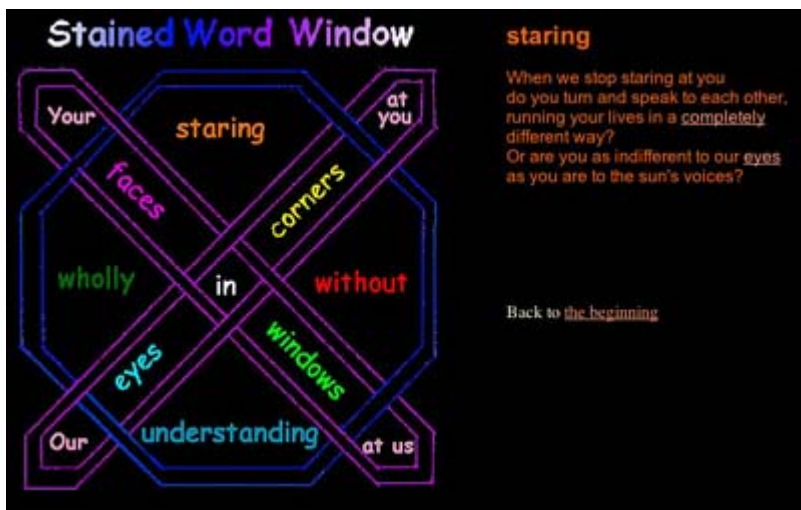
Simply mousing over a word, such as "faces", "in", "understanding", or "windows", produces brief patches of free verse which contain links, and one can always return to the beginning or opening lexia because Larsen provides a linked footer icon that brings one back to it. Texts that invite a more active, even aggressive reader need, like informational hypertext, such devices, since the reader's orientation, rather than disorientation, plays a major role.

## The document should exemplify true hypertextuality by providing multiple lines of organization

In a hypertext, whether fiction, poetry, or informational, one generally does not expect individual lexias to follow one another in linear fashion. True, linear sequences do have their use: Vannevar Bush-style trails require linear sequences, and authors of fiction use them to create a main (or default) axis for a narrative from which one can easily depart. Perhaps surprisingly, much hypertext narrative thus far takes the form of narrative loops or paths in which most of the lexias follow one another in a linear fashion, thus creating a series of self-contained stories. Of course, an electronic document may work quite well and yet not work hypertextually in any complex or interesting way. One can, for example, have hyperthexts in which the only linking serves to join an index to individual sections. To be clear, let's remind ourselves that hypertextuality –or excellence in hypertext, whatever we decide that might be – obviously is important in judging a hypertext as hypertext, but it need not necessarily play an important role in other forms of digital arts and literature. Here I'm concerned only with the problem of quality in hypertext.

Steve Cook's "Inf(l)ections" and Jeff Pack's "Growing up Digerate," exemplify successful, richly linked discursive hypertexts. Cook's stands as experiment in new forms of academic writing whereas Pack's experiment autobiography provides three different kinds of organization that the reader can follow: (1) a linear path arranged chronologically, (2) a topic-driven reading facilitated by a sitemap in the form of an alphabetical list, and (3) a multilinear narrative provided by links scattered throughout the text of individual lexias. Jackie Craven's *In the Changing Room* similarly allows both linear narrative, permitting the reader to follow the story of a single character, or move among the eight characters, each one in effect being defined as a storyline, a narrative arc. As the introduction says, "Click on an underlined word , and the stories will merge and take new form. *Your path will not be straight*. Here in the Changing Room, all things are linked and everyone is a reflection . . . of a reflection . . . of a reflection."

Animated text

Until the development of digital textuality, all writing necessarily took the form of physical marks on physical surfaces. With computers, writing, which had always been physical, now became a matter of codes —codes that could be changed, manipulated, and moved in entirely new ways. "Change the code, change the text" became the rule from which derive the advantages of so-called word processing (which is actually the composition, manipulation, and formatting of text in computer environments). The advantages of word-processing over typewriters became so immediately obvious themselves in business and academia that dedicated word-processors and then personal computers swiftly made typewriters obsolete. "Change the code, change the text" also produces the "styles" option in word processing software, such as Microsoft Word, which permits a writer to create and deploy styles containing font, type size, and rules for various text entities (paragraph, inset quotation, bibliography, and so on). By simply highlighting a word, sentence, or paragraph, the user of such software can easily modify the appearance of text, whether it is intended to remain on-screen or issue forth as a print-out or as a typeset book.

This fundamental characteristic of digital textuality has another instantiation in the form of animated text — text that moves, even dances, on the computer screen, sweeping from one side to the other, appearing to move closer to readers or retreat away from them into a simulated distance. In its simplest form, text animation simply involves moving the text on screen a line at a time, essentially dispensing the poem at a rate determined by the author. Kate Pullinger and Talan Memmot's elegant *Branded* (2003) functions in this way.
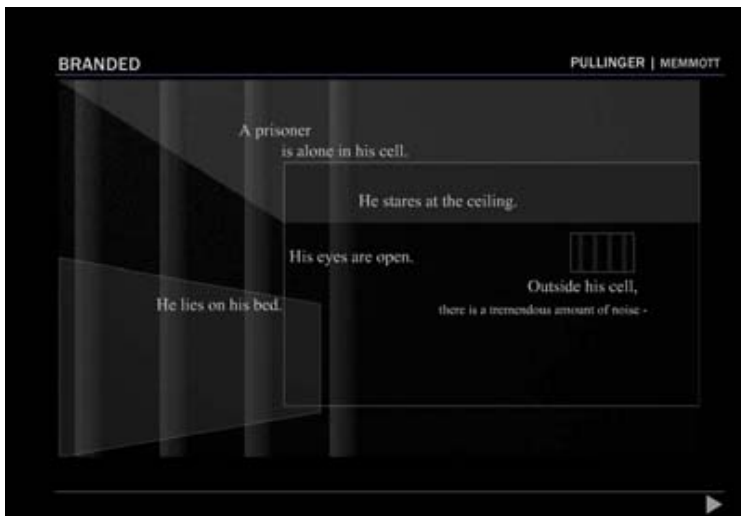
Pearl Forss's *Authorship* (2000), which combines sound and text animation, exemplifies the use of this kind of animated text to create experimental discursive writing for e-space. First, to the accompaniment of a driving drum beat, the words "What is" appear in white block letters against a black screen to which are quickly added in the red-orange words "an author?" The question mark then dances on screen, after which the sentence moves downward as words of Roland Barthes on authorship move on screen; these in turn are replaced by Forss's pronouncements about authorship; then in green appears the words "what matters who's speaking?" —a question immediately identified as having been asked by Beckett (whose name, in white, undulates on screen). Next, an image of a rose fills the entire screen, and on top of it appear many pink letters, which soon arrange themselves to state, "A rose by any other name would smell as sweet," an assertion immediately challenged by the question (in green) "or would it?" And this screen is rapidly obliterated by the appearance of images of theorists on authorship and covers of their books, all of which build to a collage. What I've described makes up the opening section or movement, several of which follow, each punctuated by the same assembling collage.

Such text animation, often accompanied by sound, appears more frequently in digital literary art than in discursive or informational projects. For example, several of the animated poems on the *Dotze Sentits: Poesia catalona d'avui* CD-ROM (1996), such as Josep Palau i Fabre's "La Noia" and Feliu Formosa's "Ell surt de sota l'aigua," accompany the sound of the poet's reading by moving words and phrases of different sizes and colors across the screen from top to bottom and from edge

of the screen to another; words pop in and out of existence, too, as the text performs itself.[7] More radical experimentation with animated text appears in Philadelpho Menezes and Wilton Azevedo's *Interpoesia: Poesia Hipmedia Interativa* (1998), in which elements (or fragments) of both spoken and written words react to the reader's manipulation of the computer mouse. Letters move, parts of words change color or disappear, and sounds become layered upon one another as the reader essentially performs the text using the sounds provided.

Moving text on screen, which has only become possible for most users with the advent of inexpensive computing power and broad bandwith, has had an effect on digital literary arts almost as dramatic as that of word-processing upon academic institutions and the workplace. But are such projects hypertextual (and does it matter)?

In one important sense, these projects, like *Branded*, appear essentially *anti*-hypertextual. If one takes hypertext to be an information technology that shares at least some of the author's power with the reader, thereby producing what some theorists have termed a "wreader," then these animated texts enforce the opposite tendency. In contrast to hypertext, they demand the reader assume a generally passive role as a member of an audience, rather than someone who has some say in what is to be read. They add, in other words, to the power of the author —or at least to the power of the text— and deny the possibility of a more empowered reader. Strickland's *Vniverse*, at which we've already looked, represents a comparatively rare example of text-animation hypermedia that strives to grant readers control; it is, however, quite unusual.

If one were to arrange print text, hypertext, video, and animated text along a spectrum, hypertext, perhaps surprisingly, would take its place closest to print. Reading written or printed text, one cannot change its order and progression, but because the text is fixed on the page, one can leave it, reading another text, taking notes, or simply organizing one's thoughts, and return to find the text where one left it, unchanged. The characteristic fixity of writing, therefore, endows the reader with the ability to process it asynchronously — that is, at the convenience of reader.[8] Consider the difference of such fixed text from video and animated text: if one leaves the television set to answer the phone or welcome a guest, the program has moved on and one cannot retrieve it, unless, that is, one has a digital or analogue copy of it and can replay it. The very great difference in degree of audience control between video as seen on broadcast television and video viewed from storage media, such as videotape or DVD, suggests that they should be considered separate media. Still, since video, like cinema, is a temporal form —a technology that presents its information in necessary sequence— one generally has to follow long patches of the story or program in its original sequence to find one's place in an interrupted narrative. Animated text, in contrast, *entirely* controls the reader's access to information at the speed and at the time the author wishes. One could, it is true,

replay the entire animated text, but the nature of the medium demands that the minimum chunk that can be examined takes the form of the entire sequence.

Another form of moving text appears in the timed links of Stuart Moulthrop's *Hegirascope*, links which dramatically affect the reader's relation to text. The reading experience produced by these timed links contrasts sharply with that possible with writing, print, and most hypertext. Since the text disappears at timed intervals outside the reader's control, the characteristic fixity of writing disappears as the document being read is replaced by another. Some of the replacements happen so quickly that this text enforces rapid reading, preventing any close reading, much less leisurely contemplation of it. Michael Joyce famously asserted that "hypertext is the revenge of text upon television" by which I take him to mean that hypertext demands active readers in contrast to television's relatively passive audience.[9] These examples of animated (or disappearing) text in contrast appear to be extensions of television and film to encompass and dominate text, or in Joyce's terms, the revenge of television (broadcast media) upon hypertext. This is not necessarily a bad thing, any more than cinema is worse than print narrative. Animated text, like cinema and video, exists as an art form with its own criteria. It's just not hypertext.

Stretch text

Not all animated alphanumeric text, it turns out, is non-hypertextual. In fact, Ted Nelson's stretchtext, which he advances as a complement to by-now standard node-and-link form, produces a truly reader-activated form.[10] When one follows a link on the World Wide Web, one of two things happen: either the present text disappears and is replaced by a new one, or the destination text opens in a new window. (On Windows machines, in which the newly opened document obscures the previous one because it appears on top of it, one has to be an experienced user to know that one can move the most recently opened window out of the way. Macintosh machines follow a different paradigm, emphasizing a multiple window presentation.)[11] By and large, standard html follows the replacement paradigm whereas other hypertext environments, such as Intermedia, Storyspace, and Microcosm, emphasize multiple windows. Stretch text, which takes a different approach to hypertextuality, does what its name suggests and stretches or expands text when the reader activates a hot area. Taking our earlier example, let's look again at the same sentence if it appeared in a system featuring stretchtext: "Like John Ruskin, Morris creates prose fantasies permeated by his beliefs about political economics." Clicking upon "John Ruskin" makes the text expand as additional words expand the sentence. "John Ruskin," for instance, could expand to become

something like "John Ruskin, the famous Victorian art and social critic popularized both gothic architecture and Pre-Raphaelitism," and if one clicked instead on "prose fantasies" one would receive basic information on that topic. Clicking on the text within the stretched text would add yet more information. When I first read about stretch text I envisioned it functioning vertically; that is, I assumed the text would move apart above and below the stretching section. When my student Ian M. Lyons created a Director demonstration of the concept, his text moved *horizontally* as new words that arrived pushed the old text to the right. Thus in Lyons' creative project when one clicks upon "text" the following new words appear, clicking again can make the newly arrived text either disappear as the text shrinks or expand further with new information.

The hyper-document should fully engage the hypertextual capacities of the particular software environment employed

In asking if an individual hypermedia project pushes the limits of the software it employs, one enters a minefield. In the first place, such a question implicitly assumes that the new, the experimental, has major value in itself, and even if one accepts this hypothesis, it might have validity only in the early stages of a genre or media form. Of course, at the present moment, all writing in hypertext is experimental since the medium is taking form as we read and write. Electronic linking, one of the defining features of this technology, can reconfigure notions of author, text, reader, writer, intellectual property, and other matters of immediate concern to those who design hypertext systems or author documents with them. Because hypertext fiction—writing at and over the edge—sets out to probe the limits of the medium itself, it acts as a laboratory to test our paradigms and our fundamental assumptions. A sample of hypertexts shows the ways they illuminate issues ranging from reader disorientation and authorial property to the nature of hypertext genres and the rules of electronic writing.

Within this project of writing-as-discovery, all elements in a hypertext system that can be manipulated can function as signifying elements. To provide an example of the creative use of system features, let us turn to a few very early examples from *Writing at the Edge* (1994), all of which were created in Eastgate Systems' Storyspace, a stand-alone hypertext environment available for both Windows and Macintosh platforms.

In addition to containing traditional elements such as fonts, graphics, sound, and color, Storyspace also supports the creative utilization of "screen real estate"— the

tiling of windows and the order in which they appear and arrange themselves. Nathan Marsh's lexias in *Breath of Sighs* place themselves around the screen, making the screen layout support the narrative as one crosses and re-crosses the tale at several points (Plate 10). Marsh's work, which dates from 1993, provided an early demonstration that writing had become visual as well as alphanumeric. It also reveals that a single software feature, such as the ability to control window size and location, leads directly to a particular mode of writing — here writing as collage and montage in which the multiple-window format permits readers to move back and forth among overlapping lexias. This feature also encourages active readers, since they can easily move about among lexias once they have opened, thus creating a kind of spatial hypertext.

Several other hypertexts from *Writing at the Edge* show the imaginative deployment of another system feature of Storyspace —the Storyspace view, a dynamic graphic presentation of the arrangement of document organization. Storyspace, a hypertext environment that also functions as a conceptual organizer, permits authors to nest individual spaces (lexias) inside others, or to rearrange the hypertext's organization by moving lexias without breaking links. Some works, like Shelley Jackson's *Patchwork Girl*, take advantage of this graphic organizational feature to structure hyperfiction by means of separate folders or directories. Others, like Ho Lin's *Nicely Done* arranges all lexias on a single level and indicates discrete narrative lines in his early hyperfiction. This hypertext novel, which links a murder story and the events of professional football championship game, suggests its organization by arranging its lexias, all of which appear on the top level, in four parallel lines. Timothy Taylor's *LBJ* —Lazarus + Barrabas + Judas— takes graphic indications of narrative and conceptual organization farther than Ho Lin's *Nicely Done,* arranging its lexias in the form of three crosses, the central one of which has a circle (halo?) over it. Here, rather than indicating the narrative structure, Taylor implies graphically something about the subject and theme of his fiction. Adam Wenger's *Adam's Bookstore*, which I have discussed elsewhere, uses a circular deployment of the graphic elements representing lexias in Storyspace View to indicate that his document can be entered—and left—at any point.[12] One of the most bravura examples of arranging lexia-icons in the Storyspace view appears in Marc A. Zbysznski's playful use of hundreds of them to create an image of a human face beneath a recycling symbol. Even the naming of lexias can provide opportunities for unexpected signification. Andrew Durden's playful arrangement of lexias in *Satyricon Randomly Generated* forms a grammatical sentence. Reading the titles of the upper-level folders reveals the following playful comment: "I / think this / lexia /is a good/start place." Stuart Moulthrop famously carried this playful use of system features much farther, creating sonnets within a menu of links!

As the previous examples from Storyspace suggest, hypertext environments have, if not precisely McLuhan's message in the medium, at least certain tendencies that

derive from specific features of the software. The capacity to control size and location of multiple windows encourages collage-like writing that employs these features, just as the presence of one-to-many linking and menus of links that have a preview function encourage certain forms of branching. Both features and the limitations or constraints of these features encourage certain ways of writing, just as the fourteen-line sonnet encourages certain kinds of poetry.

Turning from Storyspace to html and WWW, by far the most widespread form of hypermedia today, one wonders if it, like other hypermedia environments, encourages certain modes of writing. Html, which is basically an extremely simple text formatting language that works on the internet, has two defining features — first, the ability to insert links between lexias and, second, the ability to insert other media into individual lexias, originally just images but soon after sound, video, and animation created by java scripts or Flash. The rapid spread of access to broadband connections to the internet has transformed the World Wide Web from a simple system for linking text-representations into a multimedia platform. The implications of this change for anyone trying to determine the message in the medium are obvious: whereas earlier proprietary systems, such as Intermedia, Microcosm, Hypercard, Storyspace, Guide, and so on, had built-in, clearly defined characteristics, some of which provided clear limitations, the WWW does not. Anyone working with *basic* html encounters certain obvious features, which may act as imitations. These include the absence of one-to-many linking, preview features, preview functions, and inability to place and control the size of windows. Anyone using Flash or Java in html documents, however, does not necessarily confront any of these limitations, though they may confront others, such as incompatibility with particular versions of browsers. Such freedom, such absence of limitations, brings with it the relative absence of those restraints that often both limit and inspire creativity.

Conclusion

All forms of writing at their best can boast clarity, energy, rhythm, force, complexity, and nuance. Hypertext and hypermedia, forms of writing largely defined by electronic linking, are media that possess the potential qualities of multilinearity, consequent potential multivocality, conceptual richness, and — especially where informational hypertext is concerned — some degree of reader centeredness or control. Obviously, hypertexts that built upon the chief characteristics of the medium succeed. In addition, as we have seen, examples of hyperfiction and hyperpoetry reveal other sources of quality: individual links and entire webs that appear coherent, appropriate gaps among lexia, effective navigation and reader

orientation, pervasive metaphoricity, and the exploration − and testing− of the limits of the medium.

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Notes

1. In my earlier work, beginning in 1987, I have attempted to sketch out the beginnings of a rhetoric of hypertext and hypermedia, and one way of answering the question, "Is this hypertext any good?" involves looking at the degree to which a particular hypertext observes some of these minimal stylistic rules. This essay, however, tries to broaden the question, looking for other sources of aesthetic pleasure and success. For the rhetoric of hypermedia, see chapter 5 in *Hypertext 2.0*.

2. Is this the result of following a link? If one means by "following a link" that when one carries out this action (clicking) new text appears, then by definition one has followed a link, but in fact it is not clear that one has activated a link or another computational procedure. Whereas both the html and Storyspace versions of (*box(ing)*) actually involve links, so that, as in early Hypercard projects,

clicking a link actually replaces one document with another, though the reader receives the illusion that the document remains the same and a new word or phrase appears within it. One cannot tell whether or not *Vniverse* works the same way or generates text on the fly, but from the vantage point of the viewer a replacement link or what we may term an action link appear identical.

3. Lyons adds: "Thus, the parentheses and interactive interface follow mutually compatible rules to establish what I hope are complementary contributions from writ language on the screen and script code behind the scenes. . . . My aim here was simply to make good use of computers to get this ridiculous poem more legible, even as the interactive capability makes a greater range of (potentially confounding) meanings more accessible. You can think of it as magnetic poetry with rules.

4. Strickland's concern with reader empowerment appears in the detailed introduction she has appended to the project.

5. For readings of *afternoon*, see *Hypertext 2.0* and J. Yellowlees Douglas, "'How Do I Stop This Thing?': Closure and Indeterminacy in Interactive Narratives" in *Hyper/Text/Theory*, ed. George P. Landow (Baltimore: Johns Hopkins UP, 1994), 159-188; "'Cómo paro esto?'" Final e indetrminación en las narraciones interactivas" in *Teoría del hipertexto*, Traducción de Patrick Ducher (Barcelona: Paidós, 1997), 189-220.

6. For collage writing, see *Hypertext 2.0*, pp. 199-200.

7. These pieces greatly resemble the student projects in Macromedia Director carried out at the Rhode School of Design in the mid-1980s in digital typography courses conducted by Krystoff Lenk and Paul Kahn. These projects, which I have discussed elsewhere, take the form of animating the texts of poems by Berthold Brecht and Mary Oliver, so that lines move across the screen, appear and disappear, in ways that perform the poem. Occasionally, sound was added to the text as well.

8. One of the most important pioneering discussion of the importance of fixity in print culture is Marshall McLuhan's *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: U. of Toronto Press, 1962). See also Elizabeth L. Eisenstein, *The Printing Press as an Agent of Social Change: Communications and Cultural Transformations in Early Modern Europe* (Cambridge: Cambridge U.P.. 1979) and J. David Bolter, *Writing Space: The Computer in the History of Literacy*. Hillsdale, N. J.: Lawrence Erlbaum, 1990.

9. See, for example, Michael Joyce, *Of Two Minds: Hypertext Pedagogy and Poetics* (Ann Arbor: U. of Michigan Press, 1995), pp. 47, 111.

10. These paragraphs are directly inspired by Noah Wardop-Fruin's eloquent talk at Brown University's *E-fest* (April 2004), reminding us that Nelson's stretchtext demonstrates he does not limit hypertext to that created by links.

11. Jay David Bolter and Diane Gromola's *Windows and Mirrors: Interaction Design, Digital Art, and the Myth of Transparency* (Cambridge: MIT Press, 2003) contains an interesting discussion of the paradigms underlying each of these computer operating systems (or "platforms").

12. A screen shot of Wenger's project appears in *Hyper/Text/Theory*, p. 25. Michael Joyce reproduces similar projects in *Of Two Minds*, p. 38.