Rhizome and Resistance:
Hypertext and the Dreams of a New Culture

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1. Long dreams

In his novel *The War Outside of Ireland,* and more recently in his hypertext fiction *afternoon*, Michael Joyce remarks on a shift in the postindustrial wind. We seem, he suggests, to be undergoing a change of identity, weaving a fresh social fabric. "I have argued elsewhere that Japan is now everywhere. It is the long dream of a new culture."[1] Like Roland Barthes before him (*Empire of Signs*) and William Gibson after (*Neuromancer*), Joyce registers the rising appeal of a dream-state characterized by headlong technological advancement and the groundless play of signifiers. There are many reasons to think of this state as Greater Nippon — not just the recent economic prominence of Japan, but also the example it offers of a hyperadaptive, *bricoleur* society rebuilding itself from its own ruins. As Joyce says, however, "Japan" is now everywhere, not a state but a state of mind, so the name seems somewhat arbitrary. We could as easily invoke other dreams of cultural revolution: George Bush's Megalo-American "new world order"; Jean Baudrillard's nightmare of "total spatio-dynamic theatre"[2] ; Donna Haraway's vision of cyborg politics played out within "a polymorphous information system" that has become "a deadly game."[3]

All of these long dreams have something in common: the conviction that the transition from a mode of production to a "mode of information"[4] has effects exceeding the traditional boundaries of economics and politics. The transforming effect of rapidly evolving communication and information technologies appears first in the marketplace, but like Joyce's imaginary Japan, the marketplace of semiotic exchange is now everywhere: in our homes, in our bedrooms, in our minds. Changes in technology portend more than, in Mark Poster's phrase, "the end of the proletariat as Marx knew it";[5] they suggest possibilities for a reformulation of the subject, a truly radical revision of identity and social relations.[6] The effects will touch us (so we dream) in our languages, our narratives, our domestic objects, our fashion systems, our games and entertainments. The changes will be felt throughout our culture.

"The long dream of a new culture" is in fact less a revolution or overturning of the old order than it is an ecstasy, an attempt to stand outside any stable order, old or new. As Jean-François Lyotard observes, the concept of revolution itself has become invalid (along with such models as evolution, enlightenment, and class struggle). Postmodernism begins for Lyotard with "incredulity toward metanarratives," a rejection of any mythology, explanatory fiction, or paradigm story.[7] In place of paradigm Lyotard submits "paralogy" or language gaming, a strategy that advances the play of discourse by declaring the rules for commercial or intellectual performance continually negotiable.[8]

The dream of a new culture is a fantasy of immanent change, or as Gilles Deleuze and Félix Guattari put it, "smooth voyaging:"

> Voyaging smoothly is a becoming, and a difficult, uncertain becoming at that. It is not a question of returning to preastronomical navigation, nor to the ancient nomads. The confrontation between the smooth and the striated, the passages, alternations, and superpositions, are under way today, running in the most varied directions.[9]

It is precisely this "confrontation between the smooth and the striated," between two fundamentally different cultural registers, on which I want to focus in order to explore the interface between information technology and culture. This interface is in many ways a site of resistance, for the smooth and the striated can at times manifest an almost dialectical opposition; but it is also a place where polemics predicated on this apparent dialectic necessarily break down. In examining the nature of this failure we may come to a better understanding of interactive media and how they are implicated in our neocultural dreams.

2. Hypertext and rhizome

We begin on the *Thousand Plateaus* — which is appropriate for a commentary on hypertext and culture, since Deleuze and Guattari's rhizome-book may itself be considered an incunabular hypertext. Though the text arrives as a print artifact, it was designed as a matrix of independent but cross-referential discourses which the reader is invited to enter more or less at random.[10] Having no defined sequence beyond a stipulation that the conclusion be saved for last, the book's sections or "plateaus" may be read in any order. The reader's implicit task is to build a network of virtual connections (which more than one reader of my acquaintance has suggested operationalizing as a web of hypertext links).

But *A Thousand Plateaus* serves in this discussion as more than an example of proto-hypertext. It has also been a major influence on social theories and polemics which have a strong bearing on the cultural integration of new media. In the entire poststructuralist pharmacopeia, Deleuze and Guattari's cultural critique seems the most potent of psychotropics. Their major work, *Capitalism and Schizophrenia*, sets in motion perhaps the most radical reinterpretation of western culture attempted in the second half of this century. Geopolitics, psychoanalysis, neurobiology, sexuality, mathematics, linguistics, semiotics, and philosophy all fall within the purview of their encyclopedic project. Like other poststructuralist enterprises, its major efforts are directed against the order of the signified in favor of the signifier. But especially in the second part of the work, *A Thousand Plateaus*, Deleuze and Guattari do not simply uproot the old order, they go on to postulate a vividly conceived alternative.

As Brian Massumi points out in his introduction, Deleuze and Guattari's dreamed-of new culture proceeds not from *logos*, the law of substances, but rather from *nomos*, the designation of places or occasions (xiii). Hence their various co-resonating tropes of nomadism or nomadology, deterritorialization, lines of flight, smooth and striated spaces, double articulation, war machines, refrains, and rhizomes. The generating body for all these tropes (the arch-rhizome) is the concept of a social order defined by active traversal or encounter rather than objectification. Figures for this order

include the ocean of the navigator or the desert of the nomad, as opposed to the Cartesian space of the engineer or the the urban grid of the policeman. Or to invoke organic metaphors, what Deleuze and Guattari have in mind is a chaotically distributed network (the rhizome) rather than a regular hierarchy of trunk and branches. "Many people have a tree growing in their heads," Deleuze and Guattari observe, "but the brain itself is much more a grass than a tree".[11] All these metaphors attempt to displace a language founded on logocentric, hierarchically grounded truth and replace it with an unfounded play of anarchistic, contingent paralogies.

Energized by opposition to the rightward political drift of the west and the demise of state socialism in the east, these ideas have spread rhizomatically among poststructuralists and postmodernists, especially those committed to social alternatives. Thomas Pynchon's nod to Deleuze and Guattari in *Vineland* may seem trivial (he credits them with "the indispensable Italian Wedding Fake Book" which saves the day at a gangster wedding) but it suggests deeper connections between their work and his own subversive fictions.[12] In a less oblique homage, the anarcho-theorist Hakim Bey invokes nomadology to justify his Temporary Autonomous Zone, a site of resistance designed for "an era in which the State is omnipresent and all-powerful and yet simultaneously riddled with cracks and vacancies."[13] The grammatologist Gregory Ulmer takes this line of thinking further in his introduction to Teletheory, acknowledging that "[t]he challenge for us is to think nomadically from within the State apparatus."[14] Even the fundamentally traditional theorist Jay David Bolter, who does not invoke nomadology directly, seems more inclined to *nomos* than *logos* when he describes emerging writing systems as dynamic, spatial, and antihierarchical.[15]

Bolter's description of our historical moment as "the late age of print"[16] suggests that our dreams of a new culture are implicated in a specific *technologique:* the transition from a social order founded on the printing press to one in which discursive practices are redefined for newer technologies like hypertext. Likewise, Ulmer speculates on the cultural complex "TV/AI," the intersection of video and the digital processing of language (which may have less to do with artificial intelligence than it does with interactive media). We need to inquire more closely into the relationship between these conceptions and post-logocentric or nomadic thinking. What might Deleuze and Guattari's radical theories of information and culture mean for people concerned with practical informatics, especially in the areas of hypertext and hypermedia?

3. Smooth and striated writing spaces

Certainly the idea of a discourse system founded on *nomos* as opposed to *logos* relates strongly to current thinking about hypertext systems, especially those which are not viewed simply as "electronic books" or print by another name. According to Michael Joyce, who has used hypertext extensively in the teaching of writing, the medium offers writers "a structure for what does not yet exist." This is a space for improvisation and discovery where users may pursue multiple lines of association or causation rather than having to fit assertions into an exclusive, singular logic.[17] Martin Rosenberg's Rhizome writing software (discussed in his own contribution to this book), represents a similar overture toward multiple and explicitly recursive forms of expression (see pp. 412-14). It is not hard to relate these conceptions of writing space, which Joyce calls "constructive hypertext," to the distinction Deleuze and Guattari draw between smooth and striated cultural spaces.

Striated space is the domain of routine, specification, sequence, and causality. Phenomenologically, it consists of the world of perception as processed by the coordinate grid or some other geometric structure into a set of specified identities. Socially, striated space manifests itself in hierarchical and rule-intensive cultures like the military, the corporation, and the university. As Marshall McLuhan observed long ago, the dominant medium in such cultures — print — fosters an objectified and particularized view of knowledge.[18] Striated space is defined and supported by books, those totemic objects that Alvin Kernan celebrated as "ordered, controlled, teleological, referential, and autonomously meaningful."[19] The occupants of striated space are the champions of order, purpose, and control: defenders of logos, or the Law.

In smooth space, by contrast, "the points are subordinated to the trajectory."[20] Smooth space is defined dynamically, in terms of transformation instead of essence. Thus one's momentary location is less important than one's continuing movement or line of flight; this space is by definition a structure for what does not yet exist. Smooth social structures include *ad hoc* or populist political movements, cooperatives, communes, and some small businesses, subcultures, fandoms, and undergrounds. Smooth societies favor invention and indeed entrepreneurship, consensual decisionmaking as opposed to command, and holistic, parallel awareness over particular and serial analysis.

Interactive media do not represent the first technological expression of this social order. McLuhan's electronically mediated "Global Village" and Ulmer's age of video both operate in smooth space, which is best served not by the linearizing faculties of print but by the parataxis and bricolage of broadcasting. In spite of being a champion striathlete, the media critic Neil Postman discovers a fundamental truth about television when he links its basic grammar to the pseudotransition "Now... this."[21] Paradoxically, smooth social space is mediated by discontinuities. It propagates in a matrix of breaks, jumps, and implied or contingent connections which are enacted (or as Joyce would say, constructed) by the viewer or receiver. The textual model here is not the book, or as Roland Barthes called it, "the work," but rather "the text," a dynamic network of discursive relations of which any material record can only represent a subset.[22] Smooth space is an occasion, or as Deleuze and Guattari describe it, a becoming.

Does hypertext represent a smooth space for discourse, and beyond that, for textually mediated social relations? After all, interactive media exhibit the same phenomenological structure as cinema or video. Hypertexts are composed of nodes and links, local coherences and linearities broken across the gap or synapse of transition, a space which the receiver must somehow fill with meaning.[23] In describing the rhizome as a model of discourse, Deleuze and Guattari invoke the "principle of asignifying rupture," a fundamental tendency toward unpredictability and discontinuity.[24] Perhaps then hypertext and hypermedia represent the expression of the rhizome in the social space of writing. If so, these media might indeed belong in our dreams of a new culture. It might be attractive, especially if one wanted to make radical social claims, to argue that hypertext provides a laboratory or origin site for a smoothly structured, nomadic alternative to the discursive space of late capitalism.

4. Hypertext and culture

Claims along these lines have been advanced (carefully and with due reservation) by the hypertext theorists Ted Nelson, Jay David Bolter, and George Landow. Nelson suggests that interactive media will encourage "populitism," the dissemination of

specialized knowledge within unconventional or unofficial networks.[25] Bolter notes the gradual erosion of absolute social hierarchies in the west and suggests that networks and hypermedia will administer the *coup de grace*. He notes Elizabeth Eisenstein's thesis that print was an important factor in the consolidation of bourgeois culture. As Bolter sees it, however, "electronic writing has just the opposite effect. It opposes standarization and unification as well as hierarchy. It offers as a paradigm the text that changes to suit the reader rather than expecting the reader to conform to its standards."[26]

Landow is more cautious about such revolutionary claims. He considers the possibility that a decentered culture might overwhelm critical voices, yielding not a rainbow coalition but a majority blasted into silence by the explosion of electronic discourse. But though he raises concerns about the design of large-scale networks, Landow does not ultimately give this objection much credence. What reassures him is the importance of active reception in hypermedia. Landow maintains that the constantly repeated requirement of articulated choice in hypertext will produce an enlightened, self-empowered respondent: "In linking and following links lie responsibility — political responsibility — since each reader establishes his or her own line of reading."[27]

All of these conceptions (Landow's in particular) at least resemble operations in smooth social space. The hypertextual reader traces threads in any direction across the docuverse without regard to textual hierarchies. She is free (and as Landow insists, specifically licensed) to create linkages not sanctioned by the present divisions of culture and discipline — free to construct idiosyncratic networks of knowledge, or "mystories" as Gregory Ulmer calls them.[28] The genre of mystory is a way of thinking about the matrix of ideas that cuts across cultural registers, mixing the disciplinary with the personal or the ludic. Ulmer offers among his examples the (indeed plausible) linking of Ludwig Wittgenstein's *Philosophical Investigations* to the films of Carmen Miranda.[29] Until now, this sort of intertextual play has been the preserve of poststructuralist critics like Hélène Cixous and Jacques Derrida, or postmodern novelists like Kathy Acker and Thomas Pynchon. Yet this kind of textual promiscuity would be a regular feature of the cultural systems that Nelson, Bolter, and Landow describe and have undertaken to create.

Nor are these visions of smooth information systems limited to humanist concerns like literary criticism and philosophy. Nelson's Xanadu, which is still the grandest scheme for hypertext yet proposed, promises to network *all* the world's textual information. Nelson imagines a genre of information production something like the mystory, consisting almost entirely of connections between divergent texts and disciplines.[30] Presumably such a system would represent as important a resource for scientists as it would for humanists, as K. Eric Drexler has realized in his own forecasts for the future of scientific communication. Drexler proposes a hypertextual network for researchers engaged in nanotechnology, both as a medium for quicker intellectual dissemination and as a check on dangerous experimental practices.[31]

More recently, a group of information system designers from the Boeing Corporation have suggested something like smooth discursive space as a medium for large engineering projects: "Certainly hypermedia will continue to be an effective way of presenting static reference information," they note, "[b]ut a larger role for hypermedia requires eliminating the distinction between authors and readers. We assume that all members of engineering teams will be able to create and access information in a shared, distributed environment."[32]

Though the idea of computer-supported collaborative work is hardly new, the Boeing proposal introduces a fairly radical element into the shared work environment: the notion of "eliminating the distinction between authors and readers." In general, the Boeing proposal seems about as far from Deleuze and Guattari as one could imagine, except for this one striking design specification. If the distinction between author and reader were indeed eliminated, one would also have to discard any sense of textual identity or hierarchy, at least in absolute terms. Since the hyperdocument would always be in flux, it could not be constituted as a series of discursive stabilities, but would in actual fact represent a smooth space constantly reconfigured by lines of flight (a phrase which, in the case of Boeing, might be more than figurative).

But this scenario calls to mind a somewhat unbelievable prospect. Nomad *engineering?* Surely the intellectual domain of the engineer is the epitome of striated consciousness, dedicated as it is to precision, causality, and method. Wittgenstein meets Carmen Miranda may be one thing, but we have just infiltrated Deleuze and Guattari into Boeing Information Systems — an insurgency that must give us pause. What is really likely to happen when the hierarchically organized, routinized space of the corporation meets the rhizomatic propensities of electronic media? Are such encounters conceivable as anything more than flights of fancy; or might the ostensible "smoothness" of the new writing systems be more delusion than Deleuzean? As will be apparent, these questions are bound to disturb our dreams of a new culture.

5. Design anything that way...

Dreams, after all, correspond only obliquely to waking experience. Thomas Pynchon, who has a lot of interesting things to say about both dreams and technologies, has given us a parable that may be of use here. It comes from *Gravity's Rainbow*, a fiction that departs from the principles of realist narrative in ways that themselves suggest a smooth or nomadic mode of discourse. The central mysteries of the novel are never resolved, tailing off into arabesques of impossibility. The protagonist neither dies nor survives at the end but is "broken down... and scattered," his identity no longer definable in narrative terms.[33] Ostensibly unconnected characters and events participate in shadowy, irrational schemes of analogy and inversion, patterns that seem closer to intuition or dreamwork than to logical relations. Yet the author of this rhizomatic text has his roots in the striated space of the military-industrial complex. Before turning to fiction, Pynchon studied applied physics at Cornell and worked as an engineering assistant for none other than the Boeing Corporation. Moreover, the great obsession of his novel is a weapons system, the German V-2 rocket, one of the direst instruments of striated *technologique*.

Pynchon articulates the convergence of the nomadic and the techno/logical throughout *Gravity's Rainbow*, but it surfaces most vividly in the stories of Leni and Franz Pökler, two of the more ideologically significant characters in the novel. They are a classic misalliance, Cancer and Aquarius, *nomos* and *logos* sharing the same unhappy bed. Franz is a young chemical engineer who is gradually drawn into the Nazi secret weapons program. Leni is a somewhat naive socialist who travels the opposite route, joining street actions against the fascists. The marriage is doomed, but in its final days the conflict crystallizes in a way we may find instructive:

> He was the cause-and-effect man: he kept at her astrology without mercy, telling her what she was supposed to believe, then denying it. "Tides, radio interference, damned little else. There is no way for changes out there to produce changes here."
>
> "Not produce," she tried, "not cause. It all goes together. Parallel, not series. Metaphor. Signs and symptoms. Mapping on to different coordinate systems, I don't know..." She didn't know, all she was trying to do was reach.
>
> But he said: "Try to design anything that way and have it work." (159)

The domestic troubles of Franz and Leni Pökler illustrate the tension between smooth and striated cultures: the mystic and the engineer, the revolutionary and the obedient servant, the street fighter and the lab worker. In Leni's holistic or metaphoric world view, events relate semiotically, not as intersections of forces but as intertextual references among "different coordinate systems." This scheme itself maps rather neatly onto the idea of smooth space, since it describes the universe as a plenum of evocative possibilities ("signs and symptoms") rather than a hierarchy of necessary connections. We might also note that Leni becomes in the course of the novel a literal nomad. The end of the war finds her a camp survivor and a Displaced Person, haunted by nightmares of the deportation trains.

Franz, on the other hand, still believes that the striated culture of science will deliver transcendence in the form of interplanetary flight. "Cause-and-effect man," man of the Law, he derides his wife's mysticism in the name of the reality principle. For him the tangible, measurable world is all that can be the case. If information does not have direct physical consequence, if it is not *data* given over to some form of analysis, then he regards it as worthless. By the end of the novel Franz will learn the horror of his ways — most brutally when he discovers the slave labor camp that adjoins the Nordhausen missile factory. But despite this conversion, his rebuke to Leni hangs over the remainder of the novel, which after all is itself the kind of rhizomatic enterprise that Franz so deeply mistrusts.

As an implicit critique of Deleuze and Guattari's radical vision, Franz's operationalizing challenge must resonate sharply against our dreams of a nomadic hypertextual culture. *Try to design anything that way* — as a parallelistic network of signifiers with no hierarchy of sequence and no constraint on future expansion — *and have it work*. This would seem an enormous undertaking. Perhaps Boeing will need to re-hire Thomas Pynchon. More likely not, though. It seems unlikely that any practical communications system can be conceived as a nomad space, a network of signs and symptoms, or perhaps even a structure for what does not yet exist. Novels, maybe; engineering systems, probably not.

For that matter, some critics insist that even hypertextual fiction must retain a degree of striation. Thinking about the application of interactive technologies to narrative, Robert Coover notes that we may be approaching a great reversal. If multilinear forms like hypertext have emerged partly from writers' dissatisfaction with the monology of print, then perhaps, Coover speculates, writers in the age of hypertext will have the opposite complaint: "One will feel the need, even while using these vast networks and principles of randomness and expansive story line, to struggle against them, just as one now struggles against the linear constraints of the printed book."[34] Writers of hypertext — even writers of hypertext fiction — may need to carry both the Pöklers in

their minds: the anima of parallel consciousness as well as the animus who always insists that things be made to work.

6. The perils of geometry

What does it mean in practical terms to resist the "randomness and expansiveness" of hypertext? Coover suggests we must reinvent conventions, modifying familiar fictional properties like plot and character to suit the multifarious context of hypermedia.[35] Anyone who actually tries to create a large-scale hyperdocument will recognize the wisdom of this counsel. Vastness and randomness are not particularly valuable *per se*. Some principles of regulation and constraint are essential. Thus various theorists have represented hypertextual discourse not as a wholesale embrace of indeterminacy, but rather as the articulation of global variability in tension against local coherence.[36] In other words, hypertext may not be quite the smooth or rhizomatic structure some have made it out to be.

But this concession to operational demands raises some distinctly disturbing questions about our dreams of a new culture. Deleuze and Guattari register a significant warning about the misleading possibilities of techniques for multiple discourse:

> To attain the multiple, one must have a method that effectively constructs it; no typographical cleverness, no lexical agility, no blending or creation of words, no syntactical boldness, can substitute for it. In fact, these are more often than not merely mimetic procedures used to disseminate or disperse a unity that is retained in a different dimension for an image-book. Technonarcissism. Typographical, lexical, or syntactic creations are necessary only when they no longer belong to the form of expression of a hidden unity, becoming themselves dimensions of the multiplicity under consideration; we only know of rare successes in this. (22)

Though Deleuze and Guattari have print rather than electronic composition in mind here (most prominently *Finnegans Wake*), the seduction of "technonarcissism" is a very clear danger for hypertext. In designing a discursive practice dedicated to multiplicity and flexible articulation, we must always be aware of "hidden unity." That which purports to be a true multiple — a rhizome, a nomadology, a smooth space — may in fact be only a little world made cunningly, some deterministic system passing itself off as a structure for what does not yet exist. It may even be the case, as Martin Rosenberg argues in his essay in this volume, that we are hopelessly bound to determinism as a consequence of our engagement with technologies of writing.

With these possibilities in mind we may need to broaden the terms of Robert Coover's prognosis. As interactive systems come into wider use, we are indeed likely to develop a resistance to their properties; but this resistance will probably involve at least two stages. The strictly operational resistance that Coover foresees is only the beginning. If hypermedia systems do become regular features of working life in organizations like Boeing, then this problem will no doubt find a range of solutions. The struggle against hypertextual vastness will generate rhetorical or generic strategies that limit the most problematic propensities of the medium. Landow's "rhetoric of arrivals and departures"[37] and Ulmer's mystory are both likely protoypes for this response. But these rhetorical compromises will not end the troubles that Coover predicts.

A second wave of critique or resistance is likely to follow once such strategies are in place: a resistance predicated not on practice but on ideology. An early indication of this emerging line of criticism can be found in Martin Rosenberg's skeptical assessment of current hypertext theory, laid out in his contribution to this book, "Physics and Hypertext: Liberation and Complicity in Art and Pedagogy." Rosenberg registers a crucial dissent from the generally celebratory treatment of hypertext and its cultural possibilities. His analysis of hypertext theory's reliance on tropes of reversible time and linear geometry brilliantly reveals the bad faith in which many of us (myself included) have been known to operate. But precisely because Rosenberg's critique is so devastating, it leaves us all (himself included) with very little in the way of an ideological standpoint. As the title of this volume asks, *what's a critic to do?* The prospects are daunting. Nonetheless, since Rosenberg is most assuredly right in his objections, we must give his attempt at theoretical resistance close attention.

More than any other hypertext theorist, Rosenberg has recognized the hazard of technonarcissism. Developers of interactive media, in his assessment, have been irresistibly seduced by a logocentric world-view. He points out that "*anything* produced out of a systemic relationship between lexia and links, cards, buttons, and fields, also participates in the same geometrical episteme that produced Newton's laws and classical stasis theory, Feynman diagrams of sub-atomic particle interactions, formal logic, computer languages and the fractal scaling of seacoasts, black holes and chess."[38] Hypertext systems are entirely routinized, after all: they are contrivances composed of discrete rules and relationships, designed to be regular and reliable even in their "vastness and randomness." But despite this underlying allegiance to system, Rosenberg asserts, hypermedia theorists present their products as alternatives to striated discourse and its culture. Rosenberg points out that this is pure delusion. Just as the lexical play of *Finnegans Wake* does not really liberate Joyce's text from the constraints of *logos*, so no amount of apparent multiplicity can exonerate hypertext of its complicity in military-entertainment-information culture. Claiming that hypertext effects a transition from reductive hierarchies to polyvalent networks will not do. As Rosenberg observes, linearity and multilinearity are identical from a topological perspective; why should they be any different in terms of ideology? Lines are still lines, *logos* and not *nomos*, even when they are embedded in a hypertextual matrix. Such matrices are always edifices, never autonomous zones; they are structures that do not allow for deterritorialization. No technologically mediated link can ever constitute a genuine line of flight.

Rosenberg's critique is indeed chastening, and it should provoke theorists of interactive media to serious reconsideration of our more radical claims. But unlike Robert Coover, Rosenberg is unwilling to adopt an overt conservatism — as a result of which his critique forces us to confront a fundamental problem. Where Coover acknowledges that writing systems are indeed systematic, Rosenberg insists on the possibility of a true construction of the multiple, or as he puts it, "liberation." "Liberated human consciousness," he argues, "means liberation from a geometric ideological construct that disguises the nature of human awareness in order for it to better plot industrial schedules, the trajectories of cannonballs, the circumnavigation of the globe."[39] This is indeed a noble goal, and one that most hypertext theorists, as well as most liberal intellectuals, would probably espouse. But how are we to arrive at this goal? Freely (and courageously) confessing that he shares the "naivety" of most hypertext theorists, Rosenberg admits that his work on Rhizome, a constructive hypertext system for writing pedagogy, betrays its own geometrical complicities. "[A]s a teacher," Rosenberg notes,

"I recognize that logocentric thought is precisely what my students need to master first as a discourse which empowers them in the world."[40] This is rare — and important — honesty. But it does leave us at the mercy of Franz Pökler's challenge: *try to design anything that way and have it work*.

If we take Rosenberg's critique seriously (and we must), we come swiftly to the limit not just of our terms but of our communications technologies. Rosenberg has demonstrated how the concepts of *techne* and indeed function itself are at odds with our rhetoric of liberation. Our dream of a new culture requires us to abandon all operational thinking, so there is no point, really, in discussing implementations. Rosenberg's critique forces us to consider another Pynchonian fable, the fragment called "New Dope:" "the minute you take it you are rendered incapable of ever telling anybody what it's like, or worse, where to get any."[41]

The allegorical possibilities of "New Dope" are numerous: it might stand for the ultimate *Steigerung* of Gnostic enlightenment, or more simply for death, or it might represent the state of mind necessary to fully understand *Gravity's Rainbow* (once you do, you can't tell anybody about it). For our purposes, though, an economic or ideological interpretation seems more appropriate. The new dope is a commercial failure because it represents a true alternative to the capitalist order, a product which can never be advertised or effectively organized into a market — it may be significant that in Pynchon's novel, "New Dope" is presented as an underground film conceived by the black marketeer and film director Gerhardt von Göll. This could be the arch-capitalist's worst nightmare. "Dealers are as in the dark as anybody," Pynchon explains. Connections can occur only by accident. "It is the dope that finds *you*, apparently."[42]

In acknowledging Martin Rosenberg's critique of hypertextual geometries, we may have to admit that our visions of cultural revolution represent the same old new dope, a pure utopia of pure paralogia, beyond any requirements of design or rational implementation and thus absolutely unrealistic — a very long dream indeed. Though of course the reality principle cannot be kept at bay forever. If all we can do is wait for the Change to find us, then what are we to do in the meantime? If engagement with hypertext and other technologies can only lead back into the logocentric matrix, then what action should we undertake instead? These questions open onto an even more salient issue: if the operational struggle against hypertext leads to rhetorical compromise, then where does an uncompromising ideological resistance lead?

One answer is, unsurprisingly, right back to the late age of print. Rosenberg alludes briefly to practical experiments in interactive media by figures like Nancy Kaplan, Michael Joyce, and Donald Byrd, but most of his text is devoted to an admirably erudite commentary on theories of time and geometry, ranging from Bergson and Duchamp to Prigogine and Deleuze and Guattari. I want to criticize this stance, but cannot do so justly without admitting that the very same objection could be made (with less credit for scholarship) against my own essay. What you are reading now is part of a reassuring celebration of print culture. Our various appeals to intellectual heritage are not without their ideological implications. *What's a critic to do?* Having failed to theorize interactive technologies as genuine avenues of change, we retreat into a battle of the books, appealing to the core of our bibliographic tradition. In this instance the strategy is the message, and the message concerns the medium. What do we do while waiting for the New Dope to find us? We write yet more literary theory — which is arguably the most self-serving and self-involved form of logocentrism. Absent any truly transformative engagement with the pragmatics of new media, the ideological resistance

to hypertext seems to lead Rosenberg and me and a fair number of our colleagues right back to the striated space of the library — where most humanists have always been most comfortable in the first place.

7. Resistance is futile

Suppose, however, that one were willing to leave the library and develop an ideological critique of hypertext through a practical engagement with the medium. To echo Deleuze and Guattari, we only know of rare successes in this; though the ostensible failures may be much more interesting. Jay Bolter raises the possibility of such an implicated critique of hypertext with his electronic version of *Writing Space*, available as a separate title from the publishers of the book. The two texts, print and hypertext, differ significantly. The copyright provisions for the hypertext, for instance, are designed to accommodate the temptations of electronic copying and redistribution. Bolter in effect grants reproduction rights to his readers with only a few conditions and cautions:

> As long as you keep [this] text in the electronic medium, you may also change it as you see fit and hand the changes on to others. You may want to indicate that you have changed the text. On the other hand, you may not, but then your readers will probably falsely assume that the original author was responsible for the text you wrote. **All readers should be aware that anything in the text may have been added by someone other than the original author.** But of course, this caveat applies in a Borgesian way to the previous sentence as well.[43]

Bolter's Borgesian copyright notice gestures toward a kind of textual smoothness, a writing space in which individual lines of authority or proprietorship may be blurred or rearranged. The recursive playfulness of the last sentence underscores this point: perhaps even the author-function who warns you about multiple authorship is other than the one countersigned "Jay David Bolter." Welcome to the text-as-rhizome, where every apparently stable or atomic division of expression can break down to reveal a subtext, some less-than-primal scene of writing.

The playfulness of this text is in no way disingenuous. The electronic version of *Writing Space* is published in an open, read/write format: its reader can actually intervene in the text. Suppose a writer were to attempt a critique of hypertext in just such a "constructive" context, within the terms of "a structure which does not yet exist" in any fixed or definitive form. We do know of one very interesting attempt at this. The writing in question was undertaken (and this may be indicative) not by a professional critic but by an undergraduate at Carnegie Mellon University, a school known for its emphasis on science and technology. This response to hypertext came out of a pedagogical experiment inspired by theories of resistant or "strong" interpretation, in which students were asked to use hypertext to interrogate the authority of authors and teachers.[44]

The task given to students in this experiment matched the terms of Coover's prediction: both as readers and writers, they were asked to struggle against the randomness and expansiveness of the hypertextual medium as expressed in a particular electronic text. The object of their attention was a pastiche of Borges's "The Garden of Forking Paths," a story that provides some of the conceptual groundwork for hypertext fiction. In the story, Borges deconstructs the linearity of detective fiction by presenting the reader with an alternative conception of narrative time:

> In all fictional works, each time a man is confronted with several alternatives, he chooses one and eliminates the others; in the fiction of Ts'ui Pên, he chooses — simultaneously — all of them. *He creates*, in this way, diverse futures, diverse times which themselves also proliferate and fork.... Sometimes, the paths of this labyrinth converge: for example, you arrive at this house, but in one of the possible pasts you are my enemy, in another, my friend.[45]

The electronic pastiche attempts to realize the model of narrative discourse outlined in this passage, adding to the original Borges text a number of related and tangential story lines, all of them connected by a series of hypertextual links. Students could explore (and expand if they wished) a fairly dense network of narrative. But the emphasis in the experiment lay on interpretive independence, which was defined as the ability both to recognize a text's basic procedures and to imagine alternatives. The implicit challenge for students, therefore, was to subvert the hypertextual structure of multiplicity and variation, more or less as Robert Coover has specified.

The writer who responded to this challenge most ingeniously, Karl Crary, distanced himself from the hypertextual pastiche by proposing a taxonomy for this heterogeneous writing. He created categories for original, imitated, and added material, attempting to set the text in order by naming its parts and their origins. He would thus give back to Borges what was his and identify his teachers' incursions as something less than original. Crary included with this catalogue a thoughtful discussion of both the legal standing of the pastiche (dubious) and its aesthetic legitimacy (about which he was more generous). But the most crucial aspects of Crary's work lay in its material context. To begin with, he wrote not a conventional, linear essay but a hypertext, a network of places and links which can be traversed according to various sequences. Even more significant, Crary's commentary was attached to the structure of the pastiche as a subnetwork accessible at various points from the older text. Crary's submission was a composite electronic document comprising the text on which he had been asked to comment and his own discourse, both integrated into a single hypertextual network.

Because of this strategy of production, Crary's project represents a particularly clever and illuminating failure. Though his intervention makes a very bold attempt at resistant interpretation, it could not fulfill its subversive designs on the hypertextual pastiche. The reasons are fairly clear. Since Crary built his taxonomy within the hypertext on which it comments, he opened himself to a fatal recursion: his taxonomy includes itself within one of its own categories (material with no direct bearing on the Borgesian story). Because of this, although the taxonomy may comment on the pastiche, it cannot achieve any discursive separation from the original structure. It is, indeed, irresistibly joined to the object of its commentary not by a logical but by a nomadic relationship, a pathway laid out in writing space. The sort of resistance Karl Crary sets out to practice depends upon the striated space of the humanist library, where the words in the books stay between their covers. In the promiscuous or rhizomatic environment of hypertext, this kind of resistance is futile.

The limits on Crary's resistance are easiest to appreciate if we consider his text from the perspective of a subsequent reader, one who knows nothing about its authors or the conditions of its creation. Since Crary merged his contribution into the existing hypertext, it may be perceived by a subsequent reader/constructor not as authoritative critical discourse but rather as another paralogical move in the game of pastiche. That

game involves a complicated nesting of fictions within fictions. Borges's main narrative consists of the memoirs of an executed spy, framed by an unnamed editor who reminds us that the first two pages of the original text are missing. The spy's story mentions an ancestor, Ts'ui Pên, who has written a novel called (of course) "The Garden of Forking Paths." To make matters even more confusing, the pastiche adds several metafictional characters who comment on the narrative structure that contains them. Later readers have no reason to find Karl Crary, author of the taxonomy, any less fictional than these characters, or Ts'ui Pên, or the nameless editor. Perhaps we made him up, or perhaps Borges did, or perhaps Borges invented the whole bunch of us. Or vice versa. As Bolter observes, *caveat lector*.

But in bringing this warning to our attention, Karl Crary's ostensible failure produces a very enlightening demonstration of hypertextual discourse in action. It is, clearly, a "failure" only by the narrow definition of one pedagogical language game. In fact what Crary has produced is an example of a metalepsis or jump outside the game, a transforming (perhaps even liberating) move which allows us to perceive the constraints our writing systems impose on us. Having perceived and mapped these limits, we may be able to reconstitute our thinking about hypertext and rhizomatic discourse. Crary's paralogy might not lead us to the threshold of a new culture, but it might help us understand the changes that have come about in our old one.

In outcome at least, Crary's resistance to hypertext contrasts sharply with that of literary theorists. We who write theory tend to suffer from a surfeit of idealism and an antipathy to operational compromise. Confronted with the geometrical complicity of hypertext, some of us fail to acknowledge our naivety and fall back into the discursive space of print and an often unexamined nostalgia for the *logos*. Perhaps Crary fails for the opposite reason, because (at the beginning of his college career, after all) he is so solidly committed to the possibility of rational solutions. He sets out to save the text for the Law because he believes erroneously that he can design something that works, a scheme for sorting out the bewildering tangle of hypertextual relations.

But this account gives Karl Crary much less credit than he deserves. In fact his problematic encounter with hypertext represents not just the complement of our critical errors, but a model of erratic progress. For all his understandable logocentrism, Crary does not turn back to the library but instead takes his chances in the new medium. Had he wished to try a critical project like this one, he could have hit the books and written a conventional paper, as many of his classmates did. But Crary chose to work in hypertext, which takes a certain intellectual boldness to begin with. Moreover, he elected to work*within the object text itself*, and this choice was definitive. Crary invades the nomadic space of hypertext in the name of the *logos* — and if he ends up planting his flag of conquest in a hall of mirrors, he has nonetheless made a very important discovery, both for himself and for his teachers.

That discovery is the practical proof of a principle expounded by Deleuze and Guattari, namely that smooth and striated spaces "exist only in mixture: smooth space is constantly being translated, transversed into a striated space; striated space is constantly being reversed, returned to a smooth space."[46] The dyad of smooth/striated represents not a dialectic but a continuum — a conception that has considerable consequences for our understanding of hypertext and its possibilities for cultural change. To begin with, it suggests that Robert Coover is right to characterize the future of interactive media in terms of "struggle" (or as Martin Rosenberg says in his article, cultural "war"). Our work in hypertext will involve a constant alternation between *nomos* and *logos*. We will create

structures, which we will then deconstruct or deterritorialize, and which we will replace with new structures, passing again from smooth to striated space and starting the process anew.

Above all, Karl Crary's lesson in the futility of resistance can teach us something about the nature of the new culture of which we dream when we venture into hypertext. It suggests that this culture may not resemble the liberated or autonomous zones which Hakim Bey and Thomas Pynchon have fantasized. Hypertext — and its as yet more distant cousins, virtual reality and cyberspace — will not produce anarchist enclaves or pirate utopias. Rosenberg is right: with apologies to all utopian theorists, hypertext will not liberate us from geometry, rationalist method, or the other routinizing side effects of alphanumeric thinking. Nor does hypertext represent Robert Coover's "End of Books," though the foundations of print culture are bound to be shaken a bit by the new media. Hypertext and other emerging technologies mark not a terminus but a transition. As Jay Bolter has written, "[t]he computer is simply the technology by which literacy will be carried into a new age."[47]

There will of course be nothing simple about the new age or its technologies. The transition seems likely to be both permanent and perpetual. If our destiny is indeed some version of Greater Japan, then we are in for more complexity, not less: more turbulent transversals of hierarchy into nomad space, more anxious reversals of chaos into new order. Such instability and complexity come with the deterritorialized territory. Think of Tokyo, an urban immensity without street names, where every house and building has its number in the striated grid, but where personal navigation is strictly nomadic, a matter of sketches and narratives. *What's a critic to do?* Head east till you come to the Ono-Sendai Building, hang a left at the statue of Colonel Sanders, third pachinko parlor on the right, you can't miss it.

If we can say anything at this point about interactive media and their possibilities for cultural change, it must be that any new culture will be as promiscuous as its texts, always seeking new relations, fresh paralogical permutations of order and chaos. This activity may not make us *avant-garde,* but it should keep us busy. We may discover that we are the children of Leni and Franz Pökler, inheritors of both a mother-right and a patrimony, a capacity for cosmic understanding and a knack for making things work. In Pynchon's novel, Franz and Leni's daughter, Ilse, is taken away by the SS and made into a kind of living movie, returned to her father once a year for brief glimpses. In our relationship to our dream parents we will need to circumvent such dire machinations. Our medium of expression will not be anything so linear and monologic as cinema, but rather the hybrid, smooth/striated domain of hypertext, the new writing space. "Writing is pre-eminently the technology of cyborgs," Donna Haraway reminds, and our encounter with these new media may well be a first step toward cyborganism, which is perhaps the ultimate transversal of rhizome and machine.[48]

We may find ourselves one day arriving as the first nomads of cyberspace, voyaging smoothly across the grids of consensual hallucination. But such excursions are a few years off yet. For the moment, as we wait for century and millennium to play themselves out, we must be satisfied with less grandiose visions and more pragmatic insights. Here is one: in our long dreams of a new culture, we may be better served by an erroneous but venturesome conservatism than by the most radical strains of pure theory.

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[1]. Michael Joyce. *afternoon* (Cambridge: Eastgate Systems, 1990). "Japan." Hypertexts are most conveniently cited by the title of the node or lexia from which the quotation comes (in this case, "Japan").

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[3]Donna Haraway. *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991). 161.

[4]Mark Poster. *The Mode of Information: Poststructuralism and Social Context* (Chicago: U. Chicago Press, 1990). 16.

[5]Poster, 129.

[6]Poster, 111.

[7]Jean-François Lyotard. *The Postmodern Condition: A Report on Knowledge*. Trans. Geoff Bennington and Brian Massumi. (Minneapolis: U. Minnesota Press, 1984). xxiv.

[8]Lyotard, 61.

[9]Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*. Trans. Brian Massumi. (Minneapolis: U. Minnesota Press, 1987). 482. For further discussion of Deleuze and Guattari and electronic textuality, see Martin Rosenberg's essay in this collection, "Physics and Hypertext: Liberation and Complicity in Art and Pedagogy."

[10]Deleuze and Guattari, xx.

[11]Deleuze and Guattari, 15.

[12]Thomas Pynchon. *Vineland* (New York: Little, Brown, 1990). 97. For more on the Pynchon/Deleuze connection, see Martin Rosenberg's "Invisibility, the War Machine, and Prigogine: Dissipative Structures and Aggregating Processes in the Zone of *Gravity's Rainbow*." *Pynchon Notes* 29 [forthcoming].

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[15] Jay David Bolter. *Writing Space: The Computer, Hypertext, and the History of Writing* (Fairlawn NJ: Lawrence Erlbaum Associates, 1991). 159; 231.

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[19]Alvin Kernan. *The Death of Literature* (New Haven: Yale UP, 1990). 144.

[20]Deleuze and Guattari, 478.

[21]Neil Postman. *Amusing Ourselves to Death: Political Discourse in the Age of Show Business* (New York: Penguin, 1985). 99.

[22] Roland Barthes. *The Rustle of Language*. Trans. Richard Howard. (New York: Hill and Wang, 1986). 61.

[23] On the significance of gaps in the semiotics of hypertext, see Terence Harpold, "The Contingencies of the Hypertext Link." *Writing on the Edge* 2(1991): 126-39.

[24]Deleuze and Guattari, 9.

[25]Theodor Holm Nelson. "How Hypertext (Un)Does the Canon." Address. Modern Language Association Convention. December 28, 1990.

[26]Bolter, 233.

[27]George P. Landow. *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins UP, 1991). 184.

[28]Ulmer, 84.

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[32]Kathryn Malcolm, Steven Poltrock, and Douglas Schuler. "Industrial-Strength Hypermedia: Requirements for a Large Engineering Enterprise." P. Stotts and R. Furuta, eds. *Hypertext '91 Proceedings* (New York: Association for Computing Machinery, 1991). 15. For more on the applications of hypertext in industry, see: H. Van Dyke Parunak. "Toward Industrial Strength Hypermedia. E. Berk and J. Devlin, eds. *Hypertext/Hypermedia Handbook* (New York: McGraw-Hill, 1991). 381-89.

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[34]Cited in Landow, 119.

[35]Robert Coover. "The End of Books." *New York Times Book Review* June 21, 1992: 25.

[36]See Bolter, Joyce, Harpold, Landow.

[37]George P. Landow. "The Rhetoric of Hypermedia: Some Rules for Authors." P. Delany and G. Landow, eds. *Hypermedia and Literary Studies*. (Cambridge: M.I.T. Press, 1991). 81-104.

[38]Martin Rosenberg, "Physics and Hypertext: Liberation and Complicity in Art and Pedagogy," p. 393 in this volume.

[39]Rosenberg, 406.

[40]Rosenberg, 414.

[41]*Gravity's Rainbow*, 745.

[42]*Gravity's Rainbow*, 745.

[43]Jay David Bolter. *Writing Space* [hypertext version] (Fairlawn NJ: Lawrence Erlbaum Associates, 1991). "Copyright III."

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[46]Deleuze and Guattari, 474.

[47]Bolter, 237.

[48]Haraway, 176.