Hypertext on the Web: The Beginnings and Ends of Web Path-ology

Greg Elmer

The traditional definitions of hypertext begin with nonlinearity, which however is not a good place to start given the overwhelming force of our mortality in the face of our metaphors (Joyce 2000:132).

At one time archives were all about dust. For extended periods of time they served as little more than pillars or rudimentary building blocks for spider webs. Such boxes offered a place for us to place information, histories, pictures, and memories. They also served as a seasonal reminder of taxes, of family visits over holidays, spring cleanings, and dreaded household moves. Hidden behind and under more readily accessible wares, such domestic archives are, moreover, often banished to the recesses of our homes, tucked away in spaces that rarely see the light of day.

Conversely, as a medium characterized by continuously flickering lights on a screen, the internet introduces distinctly visible and networked perspectives to the study of archives. For example, on the domestic front, many computer literate users routinely upload family pictures onto their homepages on the world wide web. And while we might be inclined to argue that such networking of archives makes their contents fully accessible for all with a computer, modem, and internet service provider, the reality is much more complex, and moreover, restrictive. In this paper, I suggest that the web as e-archive, is in fact a highly stratified medium, a hierarchical form of structuring information that over the past few years has increasingly incorporated techniques to push, pull, or otherwise cajole users into following certain paths on the web.

The study of mobility, navigation, storage, and retrieval of information archives has until very recently been reduced to overly technical discussions dominated by the field of information and library sciences. In addition, since computer-mediated communication, not remote access to computer programs and data, became the first ‘killer application’ of the internet, broader social, cultural and political questions of archival practices were initially marginalized. As a consequence, early research and criticism of the internet tended...
to focus on the virtual dimension of online communication, the computer networked def-inition of ‘homesteading on the electronic frontier’, to quote from the subtitulo of Howard Rheingold’s (1993) much heralded study. The dominant paradigm in Internet studies has, as a consequence, been defined by questions of social organization in cyberspace, and the nature of on-line community and governance (see also Jones 1995; Wellman 1999; Baym and Markham 1998). How, for instance, does on-line life differ from the real thing? How is communication itself changed by the interface of the computer? Who mediates, facilitates, or outright controls this new computer mediated form of communication?

As the novelty of email has begun to wane, and attention has turned to the burgeoning World Wide Web, recent scholarship (Herman and Snow 200; Gauntlett 2000) has noticeably struggled to reconcile the hypertextual qualities of the web within more established forms of media criticism. Given the proliferation and interaction of numerous media-based programs facilitated by the world wide web (namely, video and audio streaming, interactive video games, and graphics enhanced forms of publishing), it should come as no surprise that media historians have been at the forefront of web criticism. Bolter and Grusin (1999), for instance, return to McLuhan’s focus on the technical aspects of media, in order to understand the manner in which media mold or somehow challenge content, or ‘the message’. The authors therein gaze into McLuhan’s ‘rear view mirror’ to ask how the Internet ‘remediate’old media such as radio and video. In the authors’ own words, ‘As his problematic examples suggest, McLuhan was not thinking of simple re-purposing, but perhaps of a more complex kind of borrowing in which one media is itself incorporated or represented in another media’(1999:45).

Still other scholars and theorists have suggested that in addition to understanding the re-mediated or multi-mediated nature of on-line life, we must also come to grips with the specific architectural logic of the web. As a computerized environment that links together resources and a wide variety of forms of personal communication, data and information, and streaming audio/video the web clearly differs from many narrative driven notions for organizing and transmitting information’(2000:89). Perhaps building upon Mark Poster’s (1991) influential discussion of the linguistic characteristics of databases, still other theorists have argued that archives and their contemporary manifestations, computing databases, should be recognized as systems of ‘language’(Winkler 1999), or similarly distinct ‘cultural forms’ that offer narrative structures (Manovich 1999:46).

This article offers these initial perspectives on web criticism to explain what Richard Rogers (2000) calls ‘web epistemology’—the manner in which the web structures and limits access to online forms of knowledge. To date, public debate over the role of the internet in society has been overwhelming dominated by questions of social access to the net, that is overcoming the so-called ‘digital divide’ through improved access to internet service providers (ISPs, cf. Irving 1999). One step removed from the web, remedies for the digital divide in the U.S. and across the globe, have been discussed in terms of improving remote access to knowledge. This paper, conversely, questions the means by which information on the web is structured to subtly control online life. In other words, I ask the next logical question to proponents of the access debate: what happens after users gain access to the web?

In addition to these broader social questions, the paper specifically argues that the web is currently mired in a Janus-faced pathology. The public face of the web, for example, continues to be defined by some scholars—in addition to its more obvious entrepreneurial boosters (ie. Bill Gates)—as an optimistically pluralistic (hypertextual) environment, a digitally lubricated space with all the pleasures of the ‘massage’ (as Marshall McLuhan also noted) but little to no corporeal pain. The ‘pathology’ of such approaches is largely tied to an unproblematic equation of the qualities of early hypertextual documents, systems, and technologies with hypertext on the world wide web (HTML). In other words, there has been a tendency on the part of cyber-booster and many scholars of new media and the web (including some ‘critically’ inclined theorists), to ascribe qualities to the web which are much more consistent with the ‘open architecture’ (decentered, non-linear, multi-authored) philosophy and functioning of previous hypertextual programs. Consequently, the manner in which Net users actually ‘surf’ the web—the architectural face of the web—also displays a decidedly pathologial nature, or should I say is presently governed by a logic of paths. In detailing the techniques that are used to construct such paths for users, I seek to illuminate the limitations and obstacles that new—in addition to more experienced—users face when they set about searching and navigating the networked archive we now call the web. Such a critical investigation of the limits of web surfing are particularly germane given the present cultural climate that continues to rhetorically promote the web and internet as a whole as a magical democratizing ‘machine’—one that offers a universal remedy for barriers to education, unemployment, geographical isolation, and democracy. Accordingly, one might view this article from the perspective of web-technological literacy. Though not focused exclusively on the tropes of textuality or political economy, such a project is rather defined by its emphasis on the rules of a web based topography—specifically, the manner in which users are increasingly led down specific paths in the search of archived materials or simply ‘cool stuff’.

Don’t Believe the Hype: The Limits of Digital Libertarianism and Open Architectures

If we are to believe internet industry leaders such as the fiber optic giant Nortel Networks, ‘the internet is anything you want it to be.’ In fact, in the spirit of new media interactivity,
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forms of expression and the divide between author and reader. On the latter point Landow offers the general argument that: ‘A...liberating and empowering quality of hypertext appears in the fact that the reader also writes and links, for this power, which removes much of the gap in conventional status relations between reader and author, permits readers to read actively in an even more powerful way – by annotating documents, arguing with them, leaving their own traces’ (1992:178).

Jay David Bolter’s (1991) lengthy and provocative discussion of hypertext, by comparison, moves away from broader theoretical arguments over the death of the author, polysemic reading, and active audiences, to a much more detailed investigation of the specific architecture of hypertext, that is to say the specific variables, choices, and limitations that hypertext enables. Of particular help is Bolter’s discussion of how users both follow or construct ‘paths’ in hypertext and his recognition that there are always limits and logical progressions throughout a hypertextual document or environment. Moreover, Bolter argues that ‘Paths can, as in a tree structure, indicate subordination. They can also remind the writer of relationships among topics that had to be sacrificed for the sake of an eventual hierarchy’ (1991:24). However, while Bolter clearly attempts to provide some narrative based accounts of hypertextuality, he also insists that ‘hypertext has no canonical order. Every path defines an equally convincing and appropriate reading...’ (1991:25).

Such a glaring contradiction therein calls into question Bolter’s treatment of the broader social hierarchy of ideas, ideologies, and cultural capital in hypertext.

Attempts to place hypertext within more traditional histories of modern computing have, in comparison to Bolter’s textual approach, clearly sought to place the technology within specific social and political contexts. (cf. Nyce and Khan 1991) Indeed, Vannevar Bush himself, the individual most often associated with the first conceptualizations of hypertext, acknowledged that a war weary population would be much more inclined to question, critique, reject, or fear the introduction of new technologies such as hypertext. Moreover, in descriptions of his new hypertextual technology, Bush points out the customizable and managerial possibilities of hypertext, one which Apple Computer would seize upon many decades later with its ‘hypercard’ computer software. He writes:

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As many have by now documented, hypertext offers an epistemological dilemma for a culture dominated by linear models of thought, history, and writing. George Landow’s work, for example, serves as an exemplary case study of such literary approaches to hypertext, as many of his books and articles investigate how hypertext challenges both narrative

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Nortel poses the question to television audiences: what do you want the internet to be?”.

Such bold proclamations and questions point to one of the driving imperatives on the Internet, that of user customization. Furthermore, the solution or promise of customization is itself suggestive of a much larger metainformational dilemma, that of a fruitless search through a seemingly anarchic and limitless cyber-archive. Accordingly, much has also been made of Bill Gates’ prophesied ‘friction-free’ capitalism and the cyber-utopian/libertarian rhetoric of the web in general (cf. Herman and Sloop 2000; Jordan 1999; Dyer-Witheford 2000; Robins and Webster 1999), a view reinforced by the metaphors of free flowing, limitless navigation – or ‘surfing’ – of the web. Tim Berners-Lee, the individual most commonly associated with the invention of the web, likewise ruminates about the liberatory aspects of the world wide web:

The vision I have for the Web is about anything being potentially connected with anything. It is a vision that provides us with new freedom, and allows us to grow faster than we ever could when we were fettered by the hierarchical classification systems into which we bound ourselves (1999:1-2).

Needless to say, the constant disruptions, frequent intrusions, (un)timely suggestions, gentle recommendations, and not so subtle requirements on the web would, in opposition to both Lee and Gates, suggest a more complicated, fragmented and decidedly interrupted version of on-line life. More to the point, the contradiction between a customized friction free on-line experience, and the numerous techniques by which web content is either gently ‘suggested’ (eg. Yahoo’s ‘What’s New!’ link) or outright forced upon the user is deeply rooted in the specific hypertextual architecture of the world wide web. Before moving on to a more concrete discussion of these ‘suggestive techniques’ or signposts to web path-ology, then, let us first begin by looking at the characteristics of the web’s hypertextual system, hypertext markup language (HTML).

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Page by scholars keen on questioning the broader cultural aspects of cyber-libertarianism, Lee's account of the birth of the Web and its first browser is as much a popular technical 'browsing'. At the very early stages of institutionalization Lee notes that: 'For the characteristic of today's HTML. At the outset of the book Lee offers some introductory reading-writing, non-sequential labyrinth to a much more centralized, proprietorial form, individual net users.

Readers, producers and audiences, or more to the point, web masters (owners) and individual net users.

Innovation and Compromise: The Death of the Author and the Birth of the Web Master

While Bill Gates' The Road Ahead (1996), has seemingly been deconstructed page by page by scholars keen on questioning the broader cultural aspects of cyber-libertarianism, a similarly lucid, yet decidedly more technical discussion of the public (inter) face of the Web has recently been published by one of its chief inventors, Tim Berners-Lee. Berners-Lee's account of the birth of the Web and its first browser is as much a popular technical discussion of hypertext as it is a historical document. As such, the book offers seemingly honest, and consequently unique, insight into the translation of hypertext from interactive, reading-writing, non-sequential labyrinth to a much more centralized, proprietorial form, characteristic of today's HTML.

At the outset of the book Lee offers some introductory philosophical remarks on his vision of the Web project, one which at first glance maintains anti-hierarchical and participatory elements:

New webs could be made to bind different computers together, and all new systems would be able to break out and reference others. Plus anyone browsing could instantly add a new node connected by a new link (Berners-Lee and Fiscetti 1999:1).

However, as the book's historical narrative develops its author begins to document the emergence of a Web hypertext increasingly defined by the much more passive act of 'browsing'. At the very early stages of institutionalization Lee notes that: 'For the [web-hypertext] proposal...I would have to sell this project as a documentation system — a peripheral need at CERN -- and not as a hypertext system, which just sounded too precious' (1999:19). In addition to the hierarchical and entrepreneurial limitations and biases of Lee's working environment, he later notes that in the development of the first Web browser, '...we decided not to take the time to develop the line-mode browser as an editor. Simply being able to read documents was good enough to bootstrap the process...' He later goes on to lament that '...But it left people thinking of the Web as a medium in which a few people published and most browsed. My vision was a system in which sharing what you knew or thought should be as easy as learning what someone else knew' (1999:33).

The clash between Lee's own more radically open and hypertextually defined Web and the more proprietorially defined HTML are even more evident in a series of early technical position papers written for Lee's World Wide Web Consortium at the Massachusetts Institute of Technology. Of all the Consortium's technical discussions of the web the question of links seemingly encapsulates the clear philosophical differences between previous forms of hypertext and HTML (hypertext for the WWW).

Under the appropriate heading 'Topology', for example, Lee and other members of the Consortium question the applicability of two or multi-ended links, at face value a seemingly quite logical question, as the term 'link' itself denotes (www.w3.org/DesignIssues/Topology.html). The disadvantages of such a scheme, moreover, provide further evidence of an emerging, hierarchical hypertext system on the web (HTML) -- one that lends a good deal more power to technical writers:

If [links] are bidirectional, a link always exists in the reverse direction. A disadvantage of this being enforced is that it might constrain the author of a hypertext -- we might want to constrain the reader (Lee and Fiscetti 1999:33 emphasis added)

Some three years later Lee characterizes the decision to enact a 'mono-directional' hypertext link topology as a 'fundamental compromise' (www.w3.org/DesignIssues/Architecture.html)

Thus, as discussion progresses on the contours of a proprietorial HTML, questions of protection and individual 'domains' begin to take over the Web lexicon, to such an extent that discussions of the 'collaborative possibilities of hypertext' on the Web are reduced to simple annotative possibilities of hypertext links. Accordingly, the accompanying technical discussion notes that, 'An annotation does not modify the text necessarily: one can separate protection against writing and annotation' (www.w3.org/DesignIssues/Multiuser.html).

Pathological Hypertextuality

Nevertheless, even in light of such glaring limitations to the most pervasive form of hypertext around the globe (HTML), many scholars continue to discuss hypertextuality in the abstract or focus on the anti-hierarchical tendencies and characteristics of a very select few literary hypertexts. In addition to the hypertext scholarship, recent critical studies of the web have also demonstrated an unwillingness to critique or even clarify the decentralized, non-sequential definition of hypertext. For instance, Nina Wakeford's (2000) otherwise engaging discussion of research methods for web scholars relies upon Mitra and Cohen's (1999) characterization of the 'web text' as a space where 'the reader becomes the author, in a sense, as he or she actively selects which links to follow' (Wakeford 2000:33). And while the insertion of quotation marks indicates a slight qualification of what is meant by 'authorship', such a
radical statement on the very nature of cultural production surely requires some degree of critical analysis. Mitra and Cohen and Wakeford are of course not the sole path-o-logical practitioners. Discussing the lack of any one dominant corporate interest on the Net – a contention that could very well be refuted given the immense growth (vertically and horizontally) of the AOL/Time Warner media empire – Gerald Goggin (2000) unequivocally contends that ‘There is a very real sense in which internet users are choosing where they wish to go...’ And while one could perhaps substantiate this point — at least in relation to other media technologies such as television — the author’s lack of substantial qualification and/or critical analysis of this statement unfortunately takes us no closer to understanding the manner in which the interests of capital enforce particular structures of knowledge on the web.

Mirroring some of Jay David Bolter’s hypertextually focused arguments, J. Yelloweewus Douglas (2000), also relies upon the more traditional ‘non-linear’ definitions of hypertext offered by George Landow and co-author Paul Delaney. In lieu of paths, though, Douglas argues that there are nonetheless sequential choices in hypertext fiction. Yet again, ultimately missing from Douglas’ contemporary study of literary hypertext, is a discussion of how such sequences relate to the broader valorization of canons, writing styles, subject matter, and other hierarchies. Such remarks must also begin to take into consideration more recent transformations of hypertext technology, in particular HTML. In so doing, the mediational nature of hypertextuality — the very graphic interfaces which provide us with windows into hierarchically ordered documents on-line — will inevitably highlight the signposts and other topographical markers that remind us of destinations, of points east, west, north, south, miles traveled, and notable sites worth stopping to visit. It is to such path-o-logical technologies on the World Wide Web that I turn to next.

The Techno-logic of Web Paths

While the limits of HTML are often overlooked or altogether ignored by many scholars of hypertext and other more pluralistic studies of web architecture, a critical body of literature has recently emerged to quantify, theorize, and critique the political economy of the web. Following some of Vannevar Bush’s thoughts on the architecture of a hypertext-like system in his seminal essay ‘As We May Think’, in his contention that a hypertext program would create ‘trails’ through the logic of thematic ‘association’, The nature of this ‘association’ is of course a central problematic. In other words, what rules dictate ‘association’? What ‘themes’ are given added prominence in the hierarchy of ideas and organizational motivations. An overarching response, might begin by looking at the subject index offered by Yahoo, AltaVista, and others. “[For a good discussion of the centrality of the Index for media, including the internet, see (Shields 2000), in addition to (Elmer 1997)].” The near uniformity of such indexical navigational tools are clearly an attempt to provide a predictable user-friendly standard for finding information on the web. This ordering and centering of information on the web — via default set web ‘portals’ such as Netscape’s ‘Netcenter’ — is also driven by a decidedly commercial imperative, particularly in a competitive economic environment starting to quantify the dot-com burnout rate of e-businesses.

This ongoing tension between the user friendliness provided by certain paths and their increasingly centralizing and (hopefully) profit enabling paths is clearly at play in what I perceive to be the four most dominant path-ologies of the web:

Default Paths: A Beginning and End

As a mass medium the internet could possibly be as diffuse, and de-centered as some scholars argue -- that is if it were not for the web browser. The birth of the browser, while dealing a death blow to the mass web author as earlier noted, in effect gave birth to the web as we know it today — that graphical interface that appears on a user’s computer monitor. Thus, the web browser has for all intents and purposes supplanted the centrality of the screen as mediator, regardless of its continued reliance upon its optical brilliance. In fact, the visual contours of browsers such as Netscape and Explorer on the desktop (sometimes referred to as ‘skins’) highlight the virtual boundary that separates the personal computer’s operating system and its desktop graphic user interface* (ie. Windows Mac OS), from what has become, for all intents and purposes, the personal operating system of the web (the web browser). Given the overarching role of the browser as the mediator of web content, it also serves as de facto, or should I say ‘default’, starting point for all web ‘surfs’. Consider that the same web page always greets the web user, unless she/he feels sufficiently computer literate enough the change the browser’s user ‘preferences’ to begin at another page.

As for the implicit suggestion that the hypertextually enabled web has no logical end, I offer the accompanying architectural representations of a number of web sites, mapped with the so-called ‘tactical’ web browser, Web Stalker to at least begin to suggest otherwise.** The maps, graphic representations of hypertextual links on web sites, highlight the hierarchy of web sites, replete with homepages, and other nodal points of web sites (represented as small circular hubs) joined by lines to subordinate or satellite sites (represented as spokes).

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**For technical and analytical perspectives on this program please refer to Fuller 1999 and Rogers and Morris 2000.

*Which, patently, Cubitt reminds us is akin to learning and internalizing a grammatical structure (1999:4). And while, Alexander Galloway (1999), makes a complimentary argument suggesting that HTML itself serves as a ‘mediator’, a language which func-

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In the few sites provided, the hub and spoke model is consistently reproduced, suggesting a strong tendency on the part of web masters and information systems designers to create satellite pages that only refer back to their original hub. That is to say, many sites now structure their information with tangible ‘ends’.

**Directional/Navigational Paths**

A quick glance at www.mediametrix.com’s top visited sites on the web further reinforces the centrality and popularity of search engines, Internet Service provider homepages (AOL), netguides, and portals such as Yahoo. Furthermore, on the more specific question of where users find out about web pages (where they begin certain paths on the web), recent studies of Internet use at Georgia Tech have suggested that web links and web portals are equally the most commonly used starting points (http://www.cc.gatech.edu/gvu/user_surveys/survey-1998-10/graphs/use/q52.htm).

Of course built into web browsers themselves are directional buttons, the home button -- as noted above -- playing a significant default start to many web paths. Besides the more technical buttons that stop the flow of html, provide information on security and images of pages, and print open documents, four of the remaining seven directional buttons take the user to specific Netscape portals (the default, search, content based, and shopping sites). The remaining directional buttons, back, forward, and reload, are consequently the most visibly prominent navigational tools on the web browser. Proponents of a more de-centered approach to the web might be inclined to highlight the inability to go “forward” (via the button) through a web site, an act that would most clearly enable an obvious pre-determined path. Granted, the forward button is curiously little more than a ‘last page visited’ button, more aptly defined by a ‘backward’ button. Nevertheless, the function of the web browser’s ‘backward’ button is to take the user back toward the web site’s homepage — ultimately reinforcing the hierarchical paths of a web site.

**Personalized Paths**

The most dynamic and, consequently, least understood pathologies on the web, are enabled by personalized, customized or filtering technologies. As Korinna Pateis (2000) has so aptly demonstrated, America On-line, and by extension many other commercial internet service providers (ISPs), has succeeded in constructing perhaps the most path-ological architecture of the Internet. In fact, AOL’s service is so highly structured and personalized, by way of its extensive registration process (that tailors services and content based upon the users demographic profile), that the user is in many ways ‘shielded’ from the web altogether. That is, the choice of going to the web — and leaving the all-in-one AOL universe — is not readily apparent or, perhaps promoted. ISPs such as AOL, in other words, serve as an enclosed and highly narrativized cyberspace that subtly and graphically warns against the dangers of an unchaperoned web surf. Similar attempts to construct personalized paths on the web are begun constructed by web browser ‘cookies’ — programs that facilitate the customization of content for repeat visitors to web sites — often commercial web sites (http://www.cc.gatech.edu/gvu/user_surveys/survey-1998-10/graphs/use/q52.htm). The proliferation of password enabled sites such ‘My Yahoo’ or ‘My Netscape’, likewise highlights the increasingly pervasive use of user profiling technologies on the web.

Where users are seemingly afforded the most power to construct their own paths on the web, the act of browsing is acutely curtailed. Bookmarking and revisiting specific web sites and pages is much more akin to the formatting of individual web channels, places where one consistently returns for local weather, specific professional or job related services and content, sports scores or entertainment guides. Once again, the flow of html, provide information on security and images of pages, and print open documents, four of the remaining seven directional buttons take the user to specific Netscape portals (the default, search, content based, and shopping sites). The remaining directional buttons, back, forward, and reload, are consequently the most visibly prominent navigational tools on the web browser. Proponents of a more de-centered approach to the web might be inclined to highlight the inability to go “forward” (via the button) through a web site, an act that would most clearly enable an obvious pre-determined path. Granted, the forward button is curiously little more than a ‘last page visited’ button, more aptly defined by a ‘backward’ button. Nevertheless, the function of the web browser’s ‘backward’ button is to take the user back toward the web site’s homepage — ultimately reinforcing the hierarchical paths of a web site.

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**Decentralized ‘Community’ Paths**

A competing view of hierarchical web-paths, afforded by the likes of Yahoo, AOL, Lycos and others, is offered by a number of de-centralized, or community paths. By ‘community’ paths I mean links created between various sites on the web that share common traits, content or subject matter — that is, links that do not necessarily return to a central, all-powerful, indexical site. In previous articles I have discussed two of the more prominent of such community building techniques, web-rings and web awards.

While web rings suggested just a few short years ago (Elmer 1999) a seemingly decentralized, grassroots model of community building on the web, individual rings — defined by their subject and content — have fallen victim to the problematic of centralized searches. The initial www.webring.org index site, owned by Startseed, was bought out in September 2000 by, who else, Yahoo. Similar attempts by a variety of on-line interests to centralize web site awards have been somewhat less successful (Elmer 2000).

The example of Napster and other programs such as Gnutella are further evidence of a process of de-centralization and re-centralization that has occurred both on and ‘off’ the web over the past two years. (Dyer-Witheford 2000) Hence, in admonishing the pathology of the de-centralized approach to hypertext on the web, I simply seek to insert my own path-ological, or structural, questions to the opportunities and limitations of web surfing, at times mindful of the powers that underlie and so surely benefit from such techniques. Let us not forget that paths, particularly personalized and cus-
tomized ones, discourage experimentation. Paths, needless to say, reinforce established codes of conduct, mores, and commercial interests. An understanding of the janus-faced pathology of the web therein calls into question the synergistic and monopolistic tendencies of the web -- the ‘social management’ (Cubitt 1998) and control functions of portals, search engines, net guides, and ISP home pages.

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