

The Moment of *Wired*

Thomas Streeter

When it comes to smashing a paradigm, pleasure is not the most important thing. It is the only thing. [The web browser] Mosaic is not the most direct way to find online information. Nor is it the most powerful. It is merely the most pleasurable way, and in the 18 months since it was released, Mosaic has incited a rush of excitement and commercial energy unprecedented in the history of the Net.

—*Wired*, Oct. 1994 (ten months before the Netscape IPO)

Revelations in the Cubicle: White-collar Computing in the Early 1990s

Recall—or, if you are young enough, imagine—what it was like to go online in the early 1990s. At the time, desktop computers had recently lost their novelty and become a routine part of office life. Word processing had, in the preceding five years, become a standard secretarial skill, and a new desktop computer was a standard part of an academic job offer. The desktop computer had become just another part of office routine, like the photocopier.

In most offices, however, people who used email were still a small minority, and web browsing was unknown. Those who had experimented with email a bit had done so typically within specific, confined worlds like CompuServe, Prodigy, local bulletin boards, or one of several restricted academic or corporate networks. Going online at the time was thus technically possible with the computers that were on the desks of journalists, academics, and other professionals, but it was a little out of the ordinary. If you weren't a computer professional, it was something you did out of curiosity; it took a substantial amount of time and was unlikely to yield much in the way of immediate practical value. For the vast majority, communications that mattered still happened exclusively on paper or on the phone. If you went online you knew that most people around you did not.

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Going online typically required purchasing and plugging in a roughly paperback-book-sized modem (computers did not routinely come equipped with them). The modem had a bank of mysterious flashing red lights, and using it involved installing, configuring, and then running a “terminal” program, typing commands, listening to the squealing modem, and typing in another cryptic series of commands and passwords. There was no pointing and clicking yet in the online world. Just getting it all going was at least a forty-five-minute time investment. And then figuring out what to do once signed on was a further challenge. Gateways between computer networks were still being constructed. As a result, to send, say, an email from the BITNET network—then common at less technical universities—across the still limited internet, the email addresses had to be sandwiched between quote marks and prefaced by IN%—thus: IN%“T_STREETER@uvmvax.uvm.edu”—and this technical detail was not easy to find out.

But once you mastered such arcana, you could then enter into a secret world.

This was the context in which a message appeared on a number of discussion lists in February 1993, prefaced with the following:

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From: IN%“TNC@GITVM1.BITNET” “`TECHNOCULTURE’
discussion list” 22-FEB-1993 11:48:56.39
To: IN%“T_STREETER@uvmvax.uvm.edu” “Thomas
Streeter”
Subject: John Perry Barlow meets the spooks
Folks,
This lovely missive came from SURFPUNKs (sub-
scription info below). The idea of JPB giving an in-
vited address on technology to the intelligence
(sic) community is just soooo sweet. And it’s a good
speech, too.
Larry Hunter
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The bulk of the message was the text of an address given a few months before, in December 1992, by Electronic Frontier Foundation (EFF) co-founder John Perry Barlow to a conference on National Security outside of Washington, D.C. As the message made clear, many members of the U.S. intelligence community (that is, the CIA, the NSA, the FBI) were present.

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Barlow's agenda as EFF representative was to educate this community about the value of protecting free speech and privacy in the digital realm.

Ordinarily, when speaking to a skeptical audience, most of us are likely to adopt a careful, formal, rhetorical strategy. We downplay our disagreements and differences and represent ourselves as having deep respect for the audience members. Barlow, however, began his talk this way:

I can't tell you the sense of strangeness that comes over someone who earns his living writing Grateful Dead songs, addressing people who earn their livings as many of you do, especially after hearing the last speaker. If you don't appreciate the irony of our appearing in succession, you have no sense of irony at all

The reason I am here has absolutely nothing to do with the Grateful Dead. I'm here because I met a fellow named Mitch Kapor in 1989. Despite obvious differences, I felt as if we'd both been up in the same saucer or something . . . that we shared a sense of computers being more than just better adding machines or better typewriters. We saw that computers, connected together, had the capacity to create an environment which human beings could and did inhabit The people who share this awareness are natives of the future. People who have a hard time with it may always be immigrants.

When Mitch and I saw that computers had created a place, we started asking some questions about what kind of place it was

We decided to name it Cyberspace, after Bill Gibson's description of a futuristic place rather like it which we found in his novel *Neuromancer*.¹

Here is a central example of some habits of talk and thought that would soon be moving into the mainstream with enormous impact. Barlow was the key figure in importing the term *cyberspace* from the world of science-fiction-fan programmers into middlebrow discourse; hereafter, the internet could be envisioned, not just as a tool or set of devices with predictable

1. John Perry Barlow, remarks made at the First International Symposium on National Security and National Competitiveness, McLean, Va., 1 Dec. 1992, cyberpunks.venona.com/date/1993/02/msg00258.html

potentials, but as an unknown “space” to be explored and thus available for any number of collective projections, particularly the frontier metaphor—made explicit in the name of Barlow’s foundation. But this particular refiguring of the frontier metaphor was also heavily inflected with tropes from the 1960s counterculture. Barlow’s missive featured a studied informality (“we’d both been up in the same saucer or something,” “Mitch,” “Bill”); a pleasure in iconoclasm (“if you don’t appreciate the irony”); and a flamboyant individualism (in the EFF’s relentless focus on personal privacy and liberties). But this bit of computer counterculturalism also had an association with power (the CIA!). And, crucially, in a classic countercultural maneuver, instead of flattering his audience or downplaying his differences from them Barlow offers them a choice between being one who gets it or one who doesn’t. Accept his rhetorical universe, and you are a “native of the future.” Reject it, however, and you are threatened with always being an immigrant.

At the time, reading a missive like this on a monochrome screen, perhaps during a slow day at the office or perhaps late at night at home, had an arresting effect. Barlow’s email suggested to the lone cubicle dweller that a new sense of energy was emerging in the online world. The incongruous juxtaposition of a Grateful Dead lyricist with CIA officials was funny, of course, but also enticing; how many people get invitations to talk to CIA officials, much less go on to tweak the officials’ noses and get away with it? Here was someone whose tax bracket and espionage experience were probably comparable to yours, yet he was boldly preaching to an established, powerful, and sometimes violent institution. The situation suggested a new opening, a new avenue towards power. As a white-collar reader of this text in early 1993, you felt uniquely privy to this intriguing opening because you were among the elite few who had mastered the arcane art of online access. The relative obscurity of the procedures needed to get the message only added to the aura of being part of a special group. You, who both got the joke and technically could get access to it, were invited to be one of the vanguard, one of Barlow’s “natives of the future.” It gave you a new sense of what it meant to be sitting in one’s office typing, a new, hipper, less ordinary sense of self.

The effect was indeed delicious.

In the early 1990s, growing numbers of professionals and white-collar workers were being surprised by this kind of experience on their desktop computers. As the number of people with some variety of online access increased from month to month, more and more people had an experience of stumbling upon something striking. It could be a surprising exchange on an email discussion list, involving a tidbit of insider information from

afar. Or it could be a titillating personal revelation; this was the moment when stories of email romances began to circulate in popular folklore. It could be a new form of access to something or someone, like the personal MTV gopher created as a hobby by MTV veejay Adam Curry; accessing his gopher gave one a kind of personal access to a media figure, to someone ordinarily shielded behind the glossy professionalism of the television screen. (Fans of this gopher were treated to a Barlow-like iconoclastic moment in April 1994, when Curry, with a 1960s flourish of rebellion, announced his resignation from MTV on air. He was resigning in order to pursue his digital activities full time, on the then-astonishing theory that the digital world was the wave of the future, and television was obsolete.)² Something out of the ordinary, it seemed, was afoot.

And, as Barlow's message was circulating in email discussion lists and newsgroups, the first issue of *Wired* hit the newsstands; within a year the new magazine would have a circulation of over 100,000 and a curious readership several times that.³

Building Big Systems: Technological Innovation and Corporate Liberalism

We like to think that romances and revolutions come from nowhere, as if they are their own explanation and driving force. But of course there's generally a context, like a midlife crisis or a frustrated and underemployed middle class that sets the conditions for the change. The same is true of the spread of online computing in the early 1990s. The internet rose to prominence against a backdrop of technologically tinged political-economic anxiety.

Technological innovation is a key measure of modernization, and as such its achievement is an ambition of practically every national government and most major political theories, from Marxism to Reaganism. Yet technological innovation is neither inevitable nor easily predictable; one of the challenges for theories of technological innovation lies in explaining the way in which general visions do *and do not* get implemented in specific instantiations.⁴ In the U.S. case, one relatively consistent theme that ties together the diverse examples of technological innovation is a general policy that the revisionist historians usefully labeled corporate liberalism. It is corporate both because of its association with the modern corporation and

2. See David Toop, "MTV Gets Tangled in the Net," *New York Times*, 28 May 1994.

3. See Connie Koenenn, "E-Mail's Mouthpiece: In Just a Year, *Wired* Magazine Has Become the Guide Down the Information Superhighway," *Los Angeles Times*, 30 March 1994, p. E1.

4. See Kenneth Lipartito, "Picturephone and the Information Age: The Social Meaning of Failure," *Technology and Culture* 44 (Jan. 2003): 50-81.

because it involves a certain collective vision and coordination across public and private institutions. And it is liberal because it seeks to square that collective vision with traditional individualist, liberal principles, like free enterprise.⁵ Its existence is confirmed by the historical interdependence of corporations and government, which is why the growth of big business in the twentieth century closely parallels the growth of big government. In the area of technology development, corporate liberalism was given a distinct inflection in the wake of World War II when Vannevar Bush's *Science, the Endless Frontier* made the case for creation of the National Science Foundation. Government-sponsored research in advanced areas, Bush argued, yields practical benefits that can eventually be exploited by the business world. Government and nonprofit institutions like universities and the military, the theory goes, should conduct the initial, high-risk exploratory research and then turn the results over to industry to develop commercially exploitable applications.⁶ Over the last half-century, the pattern of developing technology with initial public money followed by commercialization has been well-tested; it has brought us satellite communication, microwave ovens, computers, jet airplanes—and to a large degree, the internet.

Corporate liberal technology policy is a reigning idea, not a popular one.⁷ It is quietly applied by acronym-fluent people who work inside large organizations like universities and the Pentagon. But to the extent that it surfaces in the broader world of politics, corporate liberalism is not well loved. It is one of the main rationales for the military-industrial complex. Its machinations regularly come under fire from both the Left and the Right because it willfully blurs boundaries between public and private sectors and turns decision making over to small clubs of insider firms and institutions. It therefore generally has to negotiate a shifting minefield of political resistance.

The Information Superhighway: Al Gore, Jr., and the NSFnet

In the 1980s, enthusiasm for corporate liberal alliances reached a low ebb during the pro-market, antigovernment years of the Reagan adminis-

5. See Ellis W. Hawley, "The Discovery and Study of a 'Corporate Liberalism,'" *Business History Review* 52 (Autumn 1978): 309-20. For the relevance of corporate liberalism to technological innovation, see David F. Noble, *America by Design: Science, Technology, and the Rise of Corporate Capitalism* (New York, 1977).

6. See Vannevar Bush, *Science, the Endless Frontier: A Report to the President* (Washington, D.C., 1945).

7. Thomas Hughes, a historian and proponent of what he calls the "military-industrial-university complex," grumbles about the difficulties of convincing both the Left and the Right of the post-1960s generation that this complex was valuable; see Thomas Hughes, *Rescuing Prometheus* (New York, 1998).

tration. One significant contributor to this was the rise of the microcomputer. In the 1980s, small computers had surprised the corporate world and gone from being a hobbyist's toy to an ubiquitous feature of the modern office, providing the occasion for the rise of new industrial empires like Apple, Compaq, and Microsoft. And this turn of events had more than a little impact on the political-economic imagination. The microcomputer had provided a sophisticated, high-tech glitter to the Reagan-era enthusiasm for markets, deregulation, and free enterprise. The microcomputer became an icon that stood for what's good about the market, inspiring leaders the world over to pursue neoliberal policies; Gorbachev-era Soviet officials have claimed it was the West's astonishing success in market-driven high technology, as much as anything else, that inspired Soviet leadership to look for new economic models in the 1980s.⁸

Yet, by the early 1990s in the U.S., the desktop computer had become a commonplace of office life, the companies that made microcomputers no longer seemed like the boisterous garage start-ups of popular capitalist mythology, and Microsoft had replaced the grey, arrogant, predictable monopoly of IBM with another grey, arrogant, predictable monopoly.

In a parallel development, neoliberal economic policy seemed to be on the wane, domestically at least. The stock market had crashed in 1987—the first such crash in the U.S. since 1929—and Silicon Valley was threatened by the Japanese, particularly in the area of memory chip manufacture. The unfettered free market was looking a little less inviting and a little more threatening to significant groups of business leadership. As a result, a principled hostility to government seemed a little less appealing to executives, the business press, and many politicians. Corporations were quietly moving away from the rhetoric of competition and back towards asking for government help to organize and stabilize industries, with calls for regulations that provided what were called at the time level playing fields and regulatory backstops. Some representatives of high technology industries began calling for government-coordinated “technology policy,” which was a vague term for the use of government to provide things like tax incentives, research money, and antitrust waivers. Technological progress, many were beginning to believe, could not be left up to the market alone.

In the worlds of computing and high technology in the early 1990s, then, many who were scanning for the next wave, the next best thing after the microcomputer, were looking towards networking, but most were imagining things happening in a more collective, centralized way; if there

8. See Mikhail Gorbachev, *Memoirs*, trans. George Peronansky and Tatjana Varsavsky (New York, 1996), p. 217.

was going to be a digitalized, networked future it was going to be a cooperative project. It was not going to come out of garage start-ups but would involve forms of consortia, private/public coordination, and partnerships. Indicative of the trend was the formation of General Magic by a consortium of computer companies in 1987 or the formation in 1989 of the Computer Systems Policy Project, a lobbying group made up of the CEOs of ten computer manufacturers, including AT&T, Digital, Hewlett-Packard, and IBM.⁹

Many readers will remember all the talk about the information superhighway in the early 1990s. Because of the rich mix of political and economic energy to which the phrase became attached, it developed a lot of momentum. Politicians sought to ride on its coattails, and industry factions began to try to capture it; phone companies claimed they could provide the information superhighway, provided the government stayed out of it, thank you; and the cable industry countered by politically correcting the name of their newest technology from five hundred channel TV into cable's information superhighway.¹⁰ *Information superhighway* became so common it sprouted its own metaphorical universe, involving phrases like "road kill on the information superhighway." It's easy to forget, however, that for the first few years of this buzzword's flourishing the information superhighway was not the internet.

The phrase *information superhighway* has been around since at least the early 1980s,¹¹ and the metaphor of an "information highway" for at least a decade before that. But around 1990 *information superhighway* began to take on a very specific life inside the political circles of Washington, D.C. At the time, the U.S. economy was floundering, and the administration of George H. W. Bush was looking increasingly helpless on the economic front. *Fortune* magazine sniped that, "the President has been disengaged, reactive, and inarticulate" on the economy.¹² The Democrats in Washington sensed an opportunity; the slogan It's the Economy, Stupid would prove devastating to Bush in the next election. But the problem for mainstream Democrats was finding a way to differentiate themselves from Re-

9. See Louise Kehoe, "U.S. Computer Chiefs to Lobby Washington in Battle with Japan," *Financial Times* (London), 8 June 1989, p. 6.

10. See Mitchell Kapor, "Where Is the Digital Highway Really Heading? The Case for a Jeffersonian Information Policy," *Wired* 1 (July–Aug. 1993): 53–59, 94.

11. For example, see William D. Marbach et al., "The Dazzle of Lasers," *Newsweek*, 3 Jan. 1983, p. 38: "This year alone, AT&T will install 15,000 miles of glass fibers in commercial systems across the country. Two 'information superhighways' being built of fiber-optic cable will link Boston, New York, Philadelphia and Washington, D.C."

12. Richard I. Kirkland Jr., John Labate, and Suneel Ratan, "What the Economy Needs Now," *Fortune*, 16 Dec. 1991, p. 59.

publicans without opening themselves up to the label of tax-and-spend liberals that had been used so successfully against them in the previous decade by Ronald Reagan.

In the 1950s, Senator Albert Gore, Sr. had made a name for himself by shepherding in the interstate highway system, which gave a huge boost to the auto industry and the economy in general, while profoundly shaping American life and culture around the automobile. It was one of the most successful and beloved massive U.S. government building projects of all time, a triumph of the corporate liberal theory. To this day it stands largely above criticism. No doubt this rousing success was somewhere in the back of then-Senator Albert Gore, Jr.'s mind when in 1989 he decided to get involved in a government-sponsored effort to further the science of computer networking. Gore, Jr.'s inspiration was to link up with various proponents of advanced computer networking in the engineering community, sponsor legislation that funded the development of a state-of-the-art computer network of networks, and call the project the information superhighway.

The idea pressed several buttons at once; the high-tech industries, battered by Japanese competition and nervously groping for the next wave, looked favorably upon this modest kind of government investment, which after all could save them the cost of high-risk R & D and perhaps shield them from overly intense competition. Because the project was wrapped in the glamorous aura of high technology and a positive vision of the future, Democratic politicians, like Gore, Jr. himself, could use this safely as a model of good government intervention, undermining the Republicans' efforts to maintain power by associating Democrats with government bureaucracy and excess. And it appealed to a kind of economic nationalism: by 1991, a U.S. congressman argued for government involvement in the creation of a U.S. broadband network by saying, "the Japanese will have an information superhighway by the year 2005 and the USA won't."¹³ Small wonder, then, that Gore, Jr.'s bill moved calmly through both houses of Congress and was signed by President Bush in 1991, providing for 2.9 billion dollars over five years for building something called the NSFnet.¹⁴

Looking back on his leadership in developing legislative support for the NSFnet, Gore said during the 2000 campaign for U.S. president, "I took the initiative on the internet." This statement was then attacked in print by

13. Congressman Don Ritter, a member of the U.S. House Science, Space, and Technology Committee, quoted in Alan Stewart, "NCF Flexes Its Muscles," *Communications International* 18 (Nov. 1991): 12.

14. See Joshua Quittner, "Senate OKs \$2B for Work on National Computer Net," *New York Newsday*, 12 Sept. 1991, p. 35.

Wired magazine reporter and libertarian Declan McCullagh and eventually twisted by various Republicans into the sound bite that Gore said he invented the internet.¹⁵ From there it went on to become a favorite joke of late night comedians and a punch line in a TV pizza ad. It was a false slur, and it was irresponsible of reporters and politicians to repeat that sound bite up to the end of the campaign; it seems plausible that the joke did at least as much damage to Gore's final vote count as Ralph Nader.

But what's important about this episode is that, while the sound bite was factually untrue, it was funny. And it was funny because it appeals to a common skepticism about the orderly, managerial mode of thought associated with technology policy like Gore's. As far as Washington was concerned, the NSFnet was consistent with traditional corporate liberal policy; it was to be a technology test bed, something that would provide innovations that would eventually be implemented and broadly deployed by the private sector. And it would develop on a national basis, neatly coordinated by orderly consortia of established corporations like IBM and AT&T, perhaps eventually linking up with equally orderly systems developing in other nations around the world. It was all very high-minded. The information superhighway predicted by Gore's NSFnet initiative would be used by scientists for sophisticated research and perhaps as a kind of electronic library where thoughtful patrons would quietly and studiously gather useful information.

Gore did take the initiative on the internet, but what he had in mind was hardly the chaotic, explosive phenomenon that would soon be conveying a cornucopia of pornography, pop culture, conspiracy theories, and irrational exuberance throughout the globe. He did not have in mind Grateful Dead lyricists tweaking the nose of the CIA.

From Information Superhighway to Cyberspace: The Rise of the Middle Ranks

The internet enthusiasms of the 1990s have frequently been described as utopian, but it was really the information superhighway scenario that was utopian, in the sense of a blueprint for a better future. *Cyberspace*, by contrast, was coined in the original work of cyberpunk fiction, Gibson's *Neuromancer*, a novel that depicts a near-future world of technological violence, cruelty, manipulation, and cynical disaffection—a world that is distinctly dystopian. The appeal of *Neuromancer* is less utopian than romantic. Its tale of a "console cowboy" is a narrative of an outcast hero on a

15. See Richard Wiggins, "Al Gore and the Creation of the Internet," *First Monday*, 2 Oct. 2000, firstmonday.org/issues/issue5_10/wiggins/

desperate quest initiated by a search, not for wealth, but for inner transformation. To the computer-operating white-collar worker in the early 1990s, it provided a story line that redefined the act of sitting at a keyboard entering commands from white-collar drudgery into exploration and adventure. *Cyberspace*, by defining the internet as a space, a territory for adventure, rather than as a superhighway, a means towards the end of accessing already organized information, suggested a new potential self-definition for knowledge workers. *Information superhighway* sounds clean, obedient, and orderly. The connotations of *cyberspace* are darker, less regimented, more scary—but thereby more thrilling. Late at night, alone in one's cubicle, cyberspace has a much more alluring ring.

To understand why *cyberspace* outlived *information superhighway* in popular usage, it helps to consider exactly what kinds of people were getting online access in the early 1990s. Typical discussions of social class and computer use focus on a haves and have-nots continuum, where the concern is extending the benefits of computer use lower down on the class ladder. But it is also illuminating to look upwards on the ladder as well. Both Bill Gates and the janitor that empties your office trash bin can get along fine without desktop computers in the day-to-day of their work lives. Computers have become a central feature of the work lives specifically of the “knowledge” or professional classes, a group that includes middle managers, engineers, mid-level government bureaucrats, academics, and journalists—white collar, “knowledge” workers.

Online access, then, came first among those who *did their own word processing* and thus had the necessary equipment and experience readily at hand. Graduate students and assistant professors were online before university presidents and provosts. Middle managers, technicians, and engineers were online before CEOs. Mid-level journalists were online before editors and managers. This is a relatively unusual pattern of technological diffusion; networking entered social life through the same portal as the photocopy machine rather than through the top-down diffusion patterns of the telephone or the consumer-distribution patterns of television. This pattern thus meant that the sense of something important happening in networking would hit the middle ranks of the knowledge class first.

One can understand this broadly in Weberian terms as an articulation of the yearning for “enchantment” that comes with a highly specialized, technologically and bureaucratically organized world. At various moments, many of us go off in search of ways to reenchant our lives, to bring the magic back; and on this quest we expend energy, careers, and lives. Sometimes this impulse simply peppers the social fabric and comes out in random instances of individuals suddenly turning to, say, mountain

climbing or abrupt career changes. But at times it becomes organized and can lead to paroxysms of social change, such as the 1960s counterculture or the diverse religious movements that currently convulse our world.

The information superhighway, and the corporate liberal technology policy for which it stood, may have been reasonable, forward looking, and economically rational. But it lacked a sense of enchantment. Developing government-business partnerships that would encourage investment in wide-area computer networking for purposes of information exchange may have been a good idea, but, for the typical cubicle dweller, it did not generate much fire in the belly.

In the years leading up to 1995, the stage was thus set for the middle ranks to be treated to a drama of obliviousness from above, an object lesson in high-level bewilderment. It was the people who typed their own memos, reports, term papers, and journal articles who sensed the importance of the internet first and then watched the higher-ups struggle to catch up with them. *Cyberspace*, with its romantic hint of a rebellious self image, better captured the sense of pleasure and open-ended possibility they felt in watching their secret world trump the staid world of their superiors.

Tropes from the Counterculture: "They Don't Get It"

In one sense, the 1960s counterculture never went away. It just became available through popular memory as a set of cultural devices, a cultural tool kit for use by media executives, anti-abortion activists, rock bands, and left activists alike.¹⁶ It is a well-known fact (though not a well-theorized one) that the historical experience of the anti-Vietnam War movement and the counterculture left its mark on various segments of the computer engineering community, the "invisible colleges" within which the technology was developing. The engineers at Xerox PARC made beanbag chairs into office furniture and were celebrated for their hacker rebelliousness by Stuart Brand in *Rolling Stone* in 1972.¹⁷ Theodore Nelson's *Computer Lib* began circulating among computing professionals and amateurs in 1974, and he became a familiar sideshow at professional conferences during the decade. Steven Jobs and Steven Wozniak had founded Apple computer in 1976, after making friends while phone phreaking in college and then attending meetings of the Homebrew Computer Club, which had been founded by

16. For the concept of culture as a "tool kit," see Ann Swidler, "Culture in Action: Symbols and Strategies," *American Sociological Review* 51 (Apr. 1986): 273-86.

17. See Stewart Brand, "Spacewar: Fanatic Life and Symbolic Death among the Computer Bums," *Rolling Stone*, 7 Dec. 1972, pp. 50-58.

activists with considerable countercultural and antiwar experience.¹⁸ And, in general, the cold war consensus that had formed the cultural glue of the military-industrial complex had become ragged and worn out; the formation of Computer Professionals for Social Responsibility around anti-nuclear issues took place in 1981. During the 1970s, in sum, a small community of computer engineers and tinkerers was envisioning computers through lenses that had at least echoes of the counterculture; this then provided a set of ideas and tropes that were available to be picked up by the larger culture and made into a vehicle for promoting new meanings, new habits of talk and action.

Louis Rossetto, cofounder of *Wired*, had experienced both the original 1960s counterculture and its emerging computer-culture variant as the editor of a small journal about desktop computer publishing, *Electric Word*.¹⁹ He has said he modeled *Wired* on the early *Rolling Stone*—the sincere, pre-ironic, early 1970s *Rolling Stone*, when it was based in San Francisco and celebrated rock stars as oracles of a revolution in human consciousness. Rossetto frequently dismissed mainstream media's technology coverage with the phrase, "they just don't get it."²⁰ The phrase is part of the rhetorical foundation of outlets like the hacker website Slashdot or *Wired*; in the constant cavalier dismissal of vaguely defined, "old" institutions and points of view (for example, Microsoft, television networks, government bureaucracies, Keynesianism) these media are flattering readers by implicitly including them in the knowledgeable avant-garde. As John Perry Barlow was fond of implying, You are one of us, the mammals, and those powerful people are the dinosaurs.

A marginal social movement, when it accurately and publicly anticipates a significant historical failure of judgment on the part of leadership, can have a powerful, transformative impact. For example, being right about something when the powers that be were wrong was a central collective experience of the 1960s counterculture; by 1969, the world had

18. Steven Levy's *Hackers: Heroes of the Computer Revolution* (1984; New York, 2001) is rich with anecdotes about the countercultural experiences and styles of many of the key figures in the development of microcomputing. Theodore Roszak himself has weighed in on the connections in *From Satori to Silicon Valley: San Francisco and the American Counterculture* (San Francisco, 1986). Also see Streeter, "That Deep Romantic Chasm": Libertarianism, Neoliberalism, and the Computer Culture," in *Communication, Citizenship, and Social Policy: Re-Thinking the Limits of the Welfare State*, ed. Andrew Calabrese and Jean-Claude Burgelman (Landham, Md., 1999), pp. 49-64.

19. See Gary Wolf, *Wired: A Romance* (New York, 2003), pp. 18-21.

20. See Paul Keegan, "Reality Distortion Field," www.Upside.com, 1 Feb. 1997; see also www.edge.org/discourse/upside.html

watched the television networks, the *New York Times*, and many members of the political establishment change their position on the Vietnam War. In the mid-1990s, it would be the failure to anticipate the importance of the internet or, in the late 1990s, the value of open software. And part of the power of such moments is that they open the door to iconoclasm and to new currents of thought; if the authorities are wrong about that one thing, what else might they have missed?

At the same time, this kind of collective experience tends to draw reductive boundaries between those who knew and those who didn't. What this phrase does is tell the listener that he or she and the speaker are part of the elite group who get it. The ones who don't could be the Pentagon, the media, or your parents; in any case, there's a thrill in the implication that you and I stand apart from despised others.

If being right about some central event like Vietnam or the internet gives the rhetoric of getting it force, accuracy in general is not necessary or even a precondition for the rhetoric to work. The internet was not mentioned once in *Wired's* first issue; Rossetto had to catch up to the internet like everyone else in the media. And, more importantly, once the rhetorical ground is established by whatever means, a powerful trope for shutting down inquiry is made available. In the interview mentioned above, when Rossetto was asked if he's religious, he replied, "no." When asked if he's an atheist, he also replied, "no," and then continued: "It's not worth thinking about. . . . I mean, I've gone beyond it."²¹ The rhetoric of getting it can create conditions that make this kind of shutting down of inquiry sound wise. The reader or hearer is made automatically wary of voicing any criticism, questioning, or complexity, even to themselves. Express doubts, and you risk being worse than wrong; you risk revealing yourself to be a dinosaur and thus no longer part of the privileged club; you just don't get it.

The Moment of Mosaic: The Pleasure of Anticipation

By mid-1993, then, a growing crowd of mid-rank, white-collar computer users was quietly gaining access to networked computing, a growing portion of these were learning about and using the nonprofit, nonproprietary internet, these experiences were becoming increasingly inflected with countercultural habits and iconoclasm, and the higher ranks of leadership—the CEOs and politicians—were largely oblivious to it all. This context proved extremely fertile ground for a new, freely distributed computer program called Mosaic, the first successful graphical web browser. Mosaic 1.0 for the Macintosh and PC was released in August 1993 and spread like

21. Ibid.

wildfire through the fall of that year. The program created an almost instant wow effect, motivating ordinarily bored or preoccupied cubicle dwellers to call a colleague and tell them, “you gotta try this thing.”

This was where it all started. This was the moment of take-off in the internet frenzy of the 1990s.

Mosaic, it needs be said, was neither the first web browser nor even the first graphical web browser.²² When two employees of the University of Illinois’s National Center for Supercomputing Applications (NCSA), Eric Beena and undergraduate Marc Andreessen, decided to program a better browser near the end of 1992, they were simply making their own contribution to an ongoing networking software evolution. The main technical contribution of the first version of Mosaic for Unix they produced was the ability to display images within the page and a slightly slicker, more inviting interface. Another important contribution was the production of PC and Macintosh versions of the browser. These versions, programmed by a team of mostly undergraduate programmers, made the browsing experience more widely available.

Technically speaking, then, Mosaic was a useful but modest contribution, arguably not as important as, say, SMTP, the WWW protocol itself, or the SLIP and PPP protocols that enabled connection to the internet via a modem. And Mosaic was clearly not as important a technical contribution as the underlying TCP/IP packet switching protocol and all the software that had been written to implement it on a wide variety of computers. Mosaic did not make it possible to connect to the internet. Other programs and protocols did that. And Mosaic did not make the internet friendly; it simply made it somewhat friendlier. And it is safe to say that it was not a question of efficiency; Mosaic was a slow and cumbersome way to get information, particularly on the graphics-impaired computers of the first years. Mosaic was a fine program, but it was not a revolutionary work of genius.

So why was it Mosaic that became the killer app of the internet? Why did its successor Netscape effectively launch the internet economy of the 1990s? In part, a cumulative critical mass of people and technologies had

22. It needs be said because of the seriousness with which investors took statements like that of Netscape founder, Jim Clark: “If the invention at the heart of my first start-up was an internal combustion engine, Mosaic was fire itself” (Jim Clark and Owen Edwards, *Netscape Time: The Making of the Billion-dollar Start-up That Took on Microsoft* [New York, 1999], p. 106). But in fact there were other web browsers before Mosaic. In 1992, for example, the X-Windows-based Viola web browser had scroll-bars, back and forward buttons in the upper-left corner, a globe icon in the upper right, a url display, variegated fonts, and of course the ability to move to underlined links through the click of a mouse—just like Mosaic, Netscape, and Internet Explorer. See Ed Krol, *The Whole Internet User’s Guide and Catalog* (Sebastopol, Calif., 1992), pp. 227-33.

been reached; enough computers were becoming graphics-capable, enough of those computers were becoming connected to LANs, and enough of those LANs were being connected to the internet. But it's crucial that Mosaic wasn't so much efficient as it was pleasurable; using Mosaic was one of the first really compelling, fun experiences available on the internet. Some computer professionals tried to downplay it for that very reason: "Mostly, people use Mosaic to show off the money they spent on their PCs," observed one software executive, "you can call somebody over and say, 'Look at this.' It has got that kind of whiz-bang appeal. . . . It's like the first time you go through the library: It's fun to wander through the stacks, pulling down books. But that does wear off."²³ But of course we now know in retrospect that the fun of web browsing was not about to wear off any time soon.

What kind of pleasure did Mosaic offer? Mosaic did not satisfy desire, it provoked it. Colin Campbell has described what he calls "modern autonomous imaginative hedonism," a distinctly modern structure of pleasure in which the anticipation of pleasure becomes part of the pleasure itself and that is characteristic of the consumer culture and romanticism generally.²⁴ What one wants in this peculiarly modern form of pleasure, Campbell argues, is not the satiation of desire but desire itself; it is the desire to desire. Mosaic did not so much show someone something they wanted or needed to see as it stimulated one to imagine what one *might* see. One of the early classic ways to demonstrate the web was to click onto the website for the Louvre, to watch grainy images of paintings slowly appear on the screen. This was not pleasurable so much in what it actually delivered—better versions of the same images generally could be found in any number of art books—but in how the experience inspired the viewer to imagine *what else might be* delivered. Mosaic enacted a kind of hope; it did not deliver new things so much as a sense of the *possibility* of new things. Surfing the web using Mosaic in the early days shared certain features with the early stages of a romantic affair or the first phases of a revolutionary movement; pointing, clicking, and watching images slowly appear generated a sense of anticipation, of possibility. To engage in the dreamlike, compulsive quality of web surfing in the early days was an immersion in an endless what's next?

The Creation of Irrational Exuberance: Romanticizing the Market

By May 1993, white-collar workers in cubicles and offices across the land were quietly discovering the thrills of going online, as Andreessen and oth-

23. Josh Hyatt, "Hyperspace Map: Mosaic Helps Lead Users through Maze of Internet," *Boston Globe*, 29 Mar. 1994, p. 1.

24. See Colin Campbell, *The Romantic Ethic and the Spirit of Modern Consumerism* (Oxford, 1987), pp. 77–95.

ers worked on the code for Mosaic, as the likes of John Perry Barlow and the editorial staff of *Wired* were spreading the tropes of the computer counterculture to the middle ranks. But the mainstream was still thinking other things. That month, *U.S. News and World Report* published a “technology report” about the coming future of networked computing. The article, clearly a response to the enthusiasm surrounding Vice President Gore’s information superhighway initiatives, made no mention of the internet. It began,

The melding of the telephone, television and personal computer today has unleashed a dynamic digital revolution that promises to radically alter the way people live, work and play around the world. What new products and services can we expect from this technological upheaval? How big a market, exactly, are we talking about? And what, if anything, should the Clinton administration do to help foster these emerging technologies in America?

This was the conventional way of understanding things at the time: in the uncool business terminology of “products,” “services,” and “markets.” The article goes on to seek answers from “seven titans of technology”: Bill Gates, shopping-channel pioneer Barry Diller, AT&T chair Robert Allen, cable-TV tycoon John Malone, IBM board vice-chair Jack Kuehler, cell-phone magnate Craig McCaw, and Motorola chair George Fisher.²⁵ The article was thus organized around the assumption that, whatever happened, it would be shaped primarily by corporate leadership and corporate concerns, perhaps in interactions with government regulators spurred on by initiatives coming from the White House. Gates predicted a wallet-sized personal PC interconnected with home appliances. Others forecasted a lucrative cornucopia of online shopping, ubiquitous multimedia communication for business executives, movies-on-demand, distance education via cable TV, and growing wireless data services. All indicated an ambivalence about government’s role, expressing appreciation for the excitement generated by Gore and the Clinton White House but cautioning government regulators to stay out of the way of corporate initiatives. This was a view from the top.

Three months later, as Andreessen and his colleagues were quietly releasing the first version of Mosaic for the Macintosh and the PC, the August issue of *Scientific American* appeared with a similar overview article. In keeping with its more sophisticated readership, the article contained much

25. Jim Impoco, “Technology Titans Sound off on the Digital Future,” *U.S. News and World Report*, 3 May 1993, p. 62.

more technical detail, comparing the bandwidth and cost of various transmission technologies like fiber optic cable and ISDN, for example, and fewer interviewees were from the boardroom and more were closer to the research lab. But the basic organizing assumptions of the article were the same as the *U.S. News and World Report* piece; the bulk of the article focused on various corporations and their technologically linked interests, comparing and contrasting the schemes of various cable, phone, and media companies, interspersed with various inside-the-beltway regulatory concerns, such as common-carrier principles. The list of possible applications of the coming technology leaned a little more towards information and education than shopping; a cut-out box contained descriptions of school children communicating by email with a researcher in Antarctica, a broadcast engineer who helped diagnose his daughter's rare disease using online databases and email, an experiment with sending dental X-rays across the Atlantic, and a group of New Jersey school children communicating with teachers in Russia.²⁶ The World Wide Web was not mentioned.

This article, however, *does* mention the internet. It opens with an anecdote about Internet Society President Vinton Cerf preparing for a congressional hearing by contacting thousands of enthusiasts over the internet, pointing to the rapidly growing activity on the internet as a potential "seed" of Gore's "National Information Infrastructure." And the article is titled "Domesticating Cyberspace" and closes with a congressional representative echoing Barlow's metaphorical construction of the online world as a frontier: "Anything is a danger in cyberspace . . . There are no rules. It's the Wild West."²⁷ The Barlow-inspired metaphorical constructs of its title and opening and closing paragraphs—a vision of a wild, expansive, exciting space in the internet—would prove to resonate more profoundly than the content about corporate struggles, educational applications, and competing delivery technologies. Perhaps *Scientific American's* readership is specialized, but that readership includes politicians, executives, and, most importantly at this moment in history, reporters—reporters being among the category of people who do their own word processing.

This was the moment that the internet hit the media radar. As summer turned to fall in 1993, the internet rather suddenly became an object of media fascination. Scott Bradner, a long-time internet insider, observed with some bewilderment that "the Internet is suddenly popular . . . For reasons best known to the media gods, writing articles about the Internet seems to be the thing to do these days." He pointed out that during the fall of 1993,

26. See Gary Stix, "Trends in Communications: Domesticating Cyberspace," *Scientific American* (Aug. 1993): 100-110.

27. *Ibid.*, p. 101.

a time when only a minuscule number of people actually had internet access, 170 articles appeared in major U.S. publications mentioning the internet, as compared to 22 articles in the same period a year before. He continued,

All this attention is flattering to those of us who have been proselytizing this technology for years. The problem is that I don't see any logical reason for the current attention.

The Internet has been around and growing for more than a decade. Sure, it's big (almost two million interconnected computers worldwide) and growing fast (more than 7% a month), but it's been big and growing fast for quite a while now.

It was certainly growing at least this fast when *Time* and *Newsweek* were forecasting national video parlors for the kiddies, instead of international, on-line, interactive current affairs in the schools . . . Last month, I even found an article on the Internet in an airline flight magazine.²⁸

As the excitement about the internet grew in the media, as *Wired* and Barlow framed computer networking in breathless countercultural terms, as Mosaic circulated onto the increasing number of internet-connected LANs, members of the business world began to take note. In part, with their attention already directed by the information superhighway rhetoric towards networking, it might be unsurprising that those looking for business opportunities might follow the media towards the internet. But another key factor was the Microsoft monopoly, which played a dual role. On the one hand, Microsoft's dominance in operating systems represented the uninspiring end of the garage start-up days in microcomputing, thus motivating romantic entrepreneurs to look for something new. On the other, it was well-known that Gates had just become one of the richest men in the world and that those who had invested heavily in Microsoft in the late 1980s were beginning to reap fabulous rewards. Microsoft was thus both a reviled corporate monolith and an object lesson: might something overthrow Microsoft just as Microsoft had overthrown IBM? Might that something have to do with the internet? And might there be similar rewards to be reaped by those who accurately guessed what the next big thing would be?

Enter Netscape. Sometime in the late fall of 1993, just as the internet craze and Mosaic were entering mainstream attention, Jim Clark, founder of graphics workstation company Silicon Graphics (SGI), stumbled upon Mosaic when, in search of a new direction in technology, he was introduced to

28. Scott Bradner, "The Internet: Why Now?" *Network World*, 27 Sept. 1993, p. 20.

the web browser by an underling at SGI. Clark resigned from SGI in February 1994, flew to the NCSA in Champaign-Urbana, found Andreessen, and founded a company to commercialize the program in the spring.²⁹ With unprecedented haste, he launched the Netscape IPO just over a year later. This became the most successful IPO in history, and the model for many subsequent IPOs, setting off the internet stock craze. The largest party that capitalism has ever thrown had begun.

So why did Netscape get all this swooning attention? In part, Netscape grabbed the headlines because it was in Silicon Valley, in part because of Jim Clark's previous track record with SGI, and in part because Netscape hired Andreessen and many of the other original programmers of Mosaic. And Netscape's first browser was a good one, particularly as it channeled its start-up funds heavily into rapidly improving the program, releasing frequent updates over the internet and quickly becoming the most popular browser. Yet it needs to be remembered that at the time of the IPO, the company had no profit and almost no revenues. It was giving its principle product away for free and had no crucial patents or other dramatic advantage in the browser market. Netscape was just one of about ten companies trying to commercialize Mosaic.³⁰

To a very significant degree, Netscape captured attention because it followed a deliberate strategy of creating a media narrative heavily centered on a romanticized, heroic construction of the computer counterculture, which proved very popular with the media itself. Netscape was enchanting. Very early on, Clark hired a publicist, Rosanne Siino from SGI, and told her to present Andreessen as the "rock star" of the company. Siino then developed a strategy that carefully cultivated media attention framed in terms of "geek chic," deliberately taking reporters into the back rooms to show the chaos of the programmers' cubicles, programmers sleeping under their desks, and so forth. And she successfully turned Andreessen into a celebrity; in 1995, Andreessen appeared on the cover of *Forbes* ASAP with the blurb: "This Kid Can Topple Bill Gates." Andreessen would soon be featured in *People* magazine and appear on the cover of *Time* in his bare feet.³¹

Arguably, none of this would have worked without *Wired* magazine. *Wired* was barely more than a year old when Clark hired Andreessen, and

29. The company was originally called Mosaic Communications, but then changed its name to Netscape after complaints from the NCSA about trademark issues. To avoid confusion, the company is referred to here as simply Netscape.

30. In July 1994, at least ten companies had licensed Mosaic from the University of Illinois for commercial development, including the well-connected Spyglass and Spry. See Elizabeth Corcoran, "Mosaic Gives Guided Tour of Internet: Companies Rush to Refine an On-line Resource," *Washington Post*, 11 July 1994, p. F19.

31. Clark, *Netscape Time*, pp. 99, 100; see also p. 194.

in that year it had been full of adolescent hyperbole (Rossetto claimed that computer technology is creating “social changes so profound their only parallel is probably the discovery of fire”)³² and inaccurate predictions (besides not mentioning the internet in the first issue, the second implied that Richard Stallman’s Free Software project was outmoded and doomed).³³ And its eye-catching, Day-Glo graphics and layout were sometimes unreadable. *Wired* did not, furthermore, invent the idea that Mosaic was the killer app of the internet.³⁴

But it popularized the idea and did so in a particular way. *Wired* published its first substantial piece on the Mosaic phenomenon in October 1994, when the web was well known to internet aficionados but just beginning to attract the attention of the wider world.³⁵ Titled “The (Second Phase of the) Revolution Has Begun,” the article, by Gary Wolf, didn’t just target a good investment or new technology as a normal trade magazine piece might have. Instead, it used colloquial language and emphasized revolutionary change, pleasure, and personal expression. “When it comes to smashing a paradigm,” the article began, “pleasure is not the most important thing. It is the only thing.” In a section titled, “Why I Dig Mosaic,” Wolf observed that “Mosaic functions lurchingly, with many gasps and wheezes” and described an experience of setting off to find technical information on the nascent web and getting distracted by the process of clicking from link to link, eventually ending up on a physicist’s personal page. But while a standard review of computer software might point to this experience as problematic, Wolf did not. “The whole experience,” Wolf wrote, “gave an intense illusion, not of information, but of personality.”

Alongside the “personality” of the web, Wolf crafts an image of the personality of Andreessen. Another journalist might have interviewed the senior partner of the company, but Wolf focuses on the twenty-something junior partner and notes personal details. “A little way into the interview,” Wolf notes, “Andreessen removes his dress shirt and answers the rest of my questions in a white T-shirt. This gesture leaves the impression of a man

32. Keegan, “Reality Distortion Field.”

33. See Simson L. Garfinkel, “Is Stallman Stalled? One of the Greatest Programmers Alive Saw a Future Where All Software Was Free. Then Reality Set In,” *Wired* 1 (Mar.–Apr. 1993): 34. See also www.wired.com/wired/archive/1.01/stallman.html

34. That distinction may belong to Robert Metcalfe, the 3Com founder who in June 1994 published a column in *Infoworld* that began, “Mosaic is doing for the Internet right now what Visicalc, the proverbial killer application, did for the personal computer around 1980” (Robert Metcalfe, “Thanks, NCSA, for Graduating a Few of Your Mosaic Cyberstars,” *InfoWorld*, 6 June 1994, p. 50).

35. See Wolf, “The (Second Phase of the) Revolution Has Begun: Don’t Look Now, but Prodigy, AOL, and CompuServe Are All Suddenly Obsolete—and Mosaic Is Well on Its Way to Becoming the World’s Standard Interface,” *Wired* 2 (Oct. 1994): 116–21, 150–52.

doing battle against the businesslike backdrop” of Netscape’s headquarters. And Wolf focuses on Andreessen’s dragon-slaying attitude; working for Netscape, Wolf notes, “offers [Andreessen] a chance to keep him free from the grip of a company he sees as one of the forces of darkness—Microsoft.”

By zeroing in on Netscape and Andreessen, this *Wired* profile not only amplified the belief that Mosaic was the killer app of the internet and that Netscape would be its primary beneficiary, but it offered a romantic lens through which to see the phenomenon. As the Clinton White House and Congress took the information superhighway rhetoric off into dry committees spouting inside-the-beltway acronyms, businessmen could increasingly be seen thumbing through copies of *Wired* on airplanes, and terms like *cyberspace* and frontier metaphors began cropping up in newspaper articles and politicians’ sound bites. Without *Wired*, it’s not obvious that this libertarian-flavored, countercultural framing of computer networking would have taken hold in the mainstream.

In the ensuing years, as we all know, take hold it did. Being part of the knowledgeable vanguard was a central part of the ethos at the time. Mary Meeker, a stock analyst at Morgan Stanley and key player in the Netscape IPO and many subsequent dot com IPOs, has said, “I remember that in 1995 I would speak with Marc Andreessen and we would try to count up how many people understood this stuff . . . We thought it was about four hundred.”³⁶ Soon after the Netscape IPO, a young visionary named Jeffrey Skilling began leading a rising corporation called Enron into new territory based on the speculative trading of energy and internet-related activities; of skeptics of his strategy, Skilling is reported to have scoffed, Rossetto-like, “there were two kinds of people in the world: those who got it and those who didn’t.”³⁷ And it left its mark in politics; in the summer of 1994, conservative pundit George Gilder teamed up with futurologist Alvin Toffler and others to release a rousing document entitled “Cyberspace and the American Dream: A Magna Carta for the Knowledge Age.” The document declared a new era in which free markets and technology would make governments obsolete, a set of themes that would soon be picked up by then-Congressman Newt Gingrich.

After a point, it does little good to scoff at these patterns with a smug, “I told you so.” Many thoughtful observers knew the stock prices of the late 1990s were irrational, and many of them said so. The evidence and arguments were there, but the bubble kept expanding nonetheless. It is worth

36. John Cassidy, *Dot.com: How America Lost Its Mind and Money in the Internet Era* (New York, 2002), p. 96.

37. Wendy Zellner et al., “The Fall of Enron: How Ex-CEO Jeff Skilling’s Strategy Grew so Complex That Even His Boss Couldn’t Get a Handle on It,” *Business Week*, 17 Dec. 2001, p. 30.

ferreting out those who took advantage of the heady atmosphere to engage in various degrees of outright fraud. But one cannot blame the heady atmosphere itself only on occasional instances of exaggerated reporting, conflicts of interests, or dishonesty.

This atmosphere was precisely a fusion of the desire for wealth with romantic dreams of freedom, self-expression, and the dramatic overthrow of the powers-that-be. Without the romantic visions of freedom and revolution, there would have been nothing to get excited about; there was no gold in this gold rush, no valuable raw material, just castles in the air made of projections onto immaterial digital bits; something had to make those projections seem valuable. Yet without the hope of getting rich, the enthusiasm would never have had the energy it needed to spread. Change the world, overthrow hierarchy, express yourself, *and* get rich; it was precisely the heady mix of all of these hopes that had such a galvanizing effect.

Conclusion

Friedrich Kittler is on the right track when, in *Discourse Networks*, he suggests that one should understand romanticism, not as a collection of texts or a historical period, but as a way of organizing discourse through practices of writing, reading, and relating.³⁸ For the last two centuries or so, people who have never read Wordsworth, Byron, or Emerson have produced and consumed stories of heroic outcast wanderers on desperate quests, tales of revelation based on inner experience, celebrations of art as “the spontaneous overflow of powerful feelings,” the use of the colloquial to generate an effect of authenticity, and so forth. The Kittlerian approach correctly makes the persistence of romanticism a problem of history, social organization, and systems of communication. And Kittler’s Foucaultian use of the term *technology* to describe pedagogical manuals, child-rearing practices, and the like has a useful othering effect, displacing the romantic expressive tautologies of originary nature and genius onto a materialist analysis of their conditions of possibility. Romanticism is indeed well-described as “a certain technology of the letter.”³⁹

But the shift from expression to technology has its own risks. The problem with McLuhanism is not that it’s wrong to attribute causal power to technologies; it is that technology is imagined singularly, as the secret key that unlocks complexity, as *the* cause of cultural change. The move in Kittler from *Discourse Networks* to *Gramophone, Film, Typewriter*—one title sug-

38. See Friedrich A. Kittler, *Discourse Networks 1800/1900*, trans. Michael Mettler (Stanford, Calif., 1990).

39. David Wellbery, foreword to *ibid.*, p. xvii.

gesting an inquiry into concrete practices, the other a list of gadgets—risks too neatly reducing behaviors and differences into generalizable epistemes that can be tidily separated into distinct, technologically caused epochs. This can be particularly troubling when, by a millennial logic of succession (from 1800/1900 to 2000), the suggestion becomes that, as computers replace previous technologies of communication, consciousness is once again being transformed in one fell swoop.⁴⁰

In the case of the 1990s internet enthusiasms, it could be said that computers did not so much shape culture as the other way around. Computer networks did not create the rhetorical constructions of originary genius, of spontaneous creation-from-nowhere that functioned to promote both individuals like Andreessen and the internet itself as Promethean sources of wealth and knowledge, outside of history and social determination. The images made available by Mosaic and Netscape clearly were inspirational to many, not so much because they departed from conventional forms of representation, but to a large degree because they created a sense of anticipatory projection. The role of the web browser at first was more like that of a Rorschach-like object with which to explore fantasy. And for that fantasy to take wing, conventional, *written* romantic tropes were required, like the studied use of informal everyday language to construct authenticity, the dissemination of narratives that constructed the internet as a place for thrilling exploration, and the crafting of rebel-artist personas like Barlow and Andreessen. These tropes were often as not disseminated in conventional print, like *Wired* and *Neuromancer*. And that which was disseminated online was still largely made of traditional letters and words; what was important about the technology at first may not have been that it was digital but that it was narrowly accessible to the particular communities of those who did a lot of their own word processing. It was this historical accident of a shared

40. This slide from a Foucaultian sense of causal complexity towards a reductive, singular sense of technological causation is clear enough in some of Kittler's followers, if not in Kittler himself. Consider Kittler's description of the "1800" discourse network: "Technologies like that of book printing and the institutions coupled to it, such as literature and the university, thus constituted a historically very powerful formation, which in the Europe of the age of Goethe became the condition of possibility for literary criticism" (Kittler, *Discourse Networks 1800/1900*, p. 369). Here, specific technologies like printing are seen in conjunction with institutions like the university. But then consider the translators' introduction to Kittler's sequel, which appreciatively cites McLuhan and pronounces, "Media are the alpha and omega of theory Literature is programming." The interesting use of an attention to technology as a way to undercut an idealization of "literature" starts to become an argument that media technology trumps all else, and cybernetic metaphors start to stand in for concrete analysis (Geoffrey Winthrop-Young and Michael Wutz, "Translators' Introduction: Friedrich Kittler and Media Discourse Analysis," in Kittler, *Gramophone, Film, Typewriter*, trans. Winthrop-Young and Wutz [Stanford, Calif., 1999], pp. xx-xxi).

sense of secret access, of being in the know by virtue of being fluent with a computer modem, that allowed the early online users to experience in the internet a sense of something radically new, of a break with the past. And that experience, in turn, helped distract from the sober economic and global realities that American culture spent the 1990s so energetically avoiding.