

from
Counterculture
to
Cyberculture

Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism

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Wired

In *Wired*'s March 1993 inaugural issue, founder and editor-in-chief Louis Rossetto proclaimed that a cultural transformation was under way. "The Digital Revolution is whipping through our lives like a Bengali typhoon," he announced, bringing with it "social changes so profound their only parallel is probably the discovery of fire."¹ The magazine itself seemed to illustrate his point. Tricked out in a cacophony of type faces, swimming in a sea of Day-Glo orange and chartreuse, *Wired* was explicitly designed to conjure up the multimedia possibilities of digital convergence. To readers of that first issue, long accustomed to the traditional aesthetics and consumer orientation of the mainstream computer press, *Wired* aimed to herald the arrival not only of a new era in computing machinery, but a new era in social life. "There are a lot of magazines about technology," wrote Rossetto. "*Wired* is not one of them. *Wired* is about the most powerful people on the planet today—the Digital Generation. These are the people who not only foresaw how the merger of computers, telecommunications and the media is transforming life at the cusp of the new millennium, they are making it happen."²

Almost immediately, readers began to believe that *Wired* and the executives and engineers it profiled might in fact be harbingers of the future. Over the next five years, the magazine became a touchstone for CEOs, politicians, and, above all, other journalists. It won two National Magazine Awards, saw its readership grow to more than three hundred thousand a month, developed a book publisher (HardWired) and a variety of online ventures (HotWired, Suck), and helped spawn a clutch of magazines focused on the Internet and the New Economy, including *Fast Company*, *Business 2.0*, the *Industry Standard*, and *Red*

Herring. Thanks in part to a confluence of extraordinary economic, technological, and political currents, its technocentric optimism became a central feature of the biggest stock market bubble in American history. Its faith that the Internet constituted a revolution in human affairs legitimated calls for telecommunications deregulation and the dismantling of government entitlement programs elsewhere as well. And each month, its Technicolor pages of gadgets and gurus cataloged the delights awaiting information professionals in the New Economy.

Yet, for all its forward-looking verve, *Wired*'s vision of the digital future also carried with it a particular version of the countercultural past. In its pages, desktop computers and the Internet became tools for personal and collective liberation in a distinctly Whole Earth vein. "The '60s generation had a lot of power, but they didn't have a lot of tools," explained Jane Metcalfe, cofounder and president of *Wired*, as well as Rossetto's wife. "And in many respects their protests were unable to implement long-term and radical change in our society. We do have the tools. The growth of the Internet and the growing political voice of the people on the Internet is proof of that."³ In the pages of *Wired*, the Internet, and digital communication generally, stood as a prototype of a newly decentralized, nonhierarchical society linked by invisible bits in a single harmonious network. The builders of computers and telecommunications networks, suggested *Wired*—men like John Malone of TV cable behemoth TCI, Frank Biondi and Ed Horowitz of Viacom, and Bill Gates of Microsoft—were working to construct the high-tech infrastructure of a new and better world. So too were libertarian pundits and politicians. In the logic of *Wired*, they were simply social, as opposed to technical, engineers. Like their brethren in Silicon Valley, conservative author and media analyst George Gilder, futurist Alvin Toffler, and Republican Speaker of the House Newt Gingrich were working to bring about individual liberation and government by contract and code. Together, *Wired* seemed to suggest, these two communities had set about to free America and the world from the rigid, oppressive corporate and government bureaucracies of the twentieth century.

In 1998 Richard Barbrook and Andy Cameron named *Wired*'s particular blend of libertarian politics, countercultural aesthetics, and techno-utopian visions the "Californian Ideology." As they pointed out, by the end of the decade, its tenets had become the day-to-day orthodoxy of technologists in Silicon Valley and beyond. But this ubiquitous set of beliefs did not in fact grow out of the legacy of the New Left, as Barbrook and Cameron suggested. Rather, a close look at *Wired*'s first and most influential five years suggests that the magazine's vision of the digital horizon emerged in large part from its intellectual and interpersonal affiliations with Kevin Kelly and the Whole

Earth network and, through them, from the New Communalist embrace of the politics of consciousness.⁴

Although Louis Rossetto and Jane Metcalfe founded *Wired*, and although Rossetto's libertarian politics exerted a substantial influence on the magazine, Rossetto and Metcalfe also drew heavily for funds and, later, for subjects and writers, on the Whole Earth world. In 1992, while Kevin Kelly was finishing up *Out of Control*, Rossetto hired him to serve as executive editor of the magazine. Kelly brought with him the simultaneously cybernetic and New Communalist social vision of the Whole Earth publications and their networked style of editorial work. Together with Rossetto and managing editor John Battelle, Kelly turned *Wired* into a network forum. Within it, writers utilized the computational metaphors and universal rhetoric of cybernetics to depict New Right politicians, telecommunications CEOs, information pundits, and members of GBN, the WELL, and other Whole Earth-connected organizations as a single, leading edge of countercultural revolution. Together, *Wired* suggested, this digital generation would do what the New Communalists had failed to accomplish: they would tear down hierarchies, undermine the sorts of corporations and governments that had spawned them, and, in the hierarchies' place, create a peer-to-peer, collaborative society, interlinked by invisible currents of energy and information.

By the end of the decade, theirs would be the governing myth of the Internet, the stock market, and great swaths of the New Economy.

Founding *Wired*

For all his magazine's countercultural rhetoric, Louis Rossetto saw the digital revolution as an extension of a long-standing, if not widely acknowledged, American libertarian tradition. After growing up in suburban Long Island, Rossetto had arrived at Columbia University in 1967. By that time, the Vietnam War was nearing its apogee, as were antiwar protests and domestic violence. In April 1968, less than three weeks after the assassination of Martin Luther King, a group of students occupied buildings on Columbia's main quad to protest the university's involvement in military research and its mismanagement of relations with the local African American community. Columbia's president responded by calling in more than one thousand police in the middle of the night. They arrested 692 strikers and cleared out the buildings. As Todd Gitlin has pointed out, the occupation at Columbia marked a turning point for the SDS and the New Left generally.⁵ In the years to come, antiwar protests turned increasingly violent, with bombings by young leftists and attacks by police on marchers becoming common.

To Louis Rossetto, this shift suggested the futility of agonistic politics as a whole. Rossetto had served as the president of the Columbia Young Republicans, campaigned for Nixon, and celebrated Nixon's election in 1968 with other Republicans at New York's Waldorf-Astoria Hotel. By his junior year, though, he had begun to think of himself as a libertarian anarchist. That year, he gathered a group of like-minded friends into a loose confederation they called the Freedom Conspiracy. He read psychologist Wilhelm Reich's calls for sexual freedom and Marshall McLuhan's multimedia collage books, and at the same time discovered Ayn Rand. In his senior year, he wrote a long paper on the libertarian stream in American thought, in which he chronicled the work of long-forgotten figures such as Benjamin Tucker, a turn-of-the-century editor of the magazine *Liberty* and an ardent follower of social Darwinist Herbert Spencer, and Lysander Spooner, an abolitionist and the operator of a private postal service that he created to challenge the government's monopoly on the mails. In 1971 Rossetto and his friend Stan Lehr published a lengthy article in the *New York Times Magazine* entitled "The New Right Credo—Libertarianism." In it they argued that "liberalism, conservatism and leftist radicalism are all bankrupt philosophies. The only question at issue among their adherents is which gang of crooks and charlatans is to rule society, and for what noble purpose." As Rossetto recalled nearly thirty years later, "it wasn't a Buckleyite conservatism that got me—it was the individualist, anti-statist conservatism that got me." At about the same time that Ken Kesey and the Merry Pranksters were rejecting the politics of the New Left and the hippies of the Haight were heading back to the land, Rossetto was coming to a similarly antipolitical position. In his work with the Young Republicans, he later remembered, he had come to believe that "in order to influence [the political world] you had to become it. The best way to change things was to walk away. . . . You had to start with yourself."⁶

In 1973 Rossetto earned an MBA from Columbia. Over the next decade, though, he drifted. He wrote a novel entitled *Takeover* about an American president who avoids impeachment by faking a national security crisis; the novel appeared a week before Richard Nixon resigned, and it received little attention. Some years later, he found himself in Rome, working on the set of the film *Caligula*. He decided to use the orgies he had seen on the set as a metaphor for the sexual revolution and penned a book called *Ultimate Porno*. Like *Takeover*, it vanished quickly. Finally, in the mid-1980s, Rossetto found his way to Ink, an Amsterdam-based translation firm that served high-tech companies. He produced a magazine for them in which the company could advertise its translation software. Gradually, he began to cover other technologies, including desktop publishing, CD-ROMs, and the like. In 1986 the

magazine became *Language Technology*, and in 1988, *Electric Word*. Jane Metcalfe, whom Rossetto had met during a stint in Paris several years earlier, joined Rossetto and became marketing director for the magazine.

For Rossetto and Metcalfe, the magazine provided a vehicle with which to build the networks on which *Wired* would later depend. In 1988 Rossetto read *Time* magazine's report on the Media Lab and sought out Nicholas Negroponte for an interview. He later found his way to hypertext guru Ted Nelson and to Richard Saul Wurman, the host of one of the most important networking events in the computer industry, the soon-to-be-annual Technology, Entertainment, and Design (TED) Conference. In 1988 Kevin Kelly gave *Electric Word* an enthusiastic review in *Signal*, thus alerting a number of San Francisco Bay area technology journalists to its existence.

Around the time when the *Signal* review appeared, Rossetto began visiting the United States in the hope of bringing the magazine there. New York City journalist Michael Wolff met with Rossetto as a favor to a friend. "I opened the door to a Christ-like figure with dramatic hair and a rucksack over his shoulder," Wolff later recalled. "He had watery eyes, a caring, 'I have been hurt' voice, and an otherworldly presence. . . . I thought he was a lost soul."⁷ Rossetto and Metcalfe also made a trip through California at about this time and met with Kevin Kelly as well. Kelly was not much more interested than Wolff had been, at least at first.⁸ By 1991, though, *Electric Word* had gone out of business and Rossetto and Metcalfe had moved to New York. They brought with them the idea for a new lifestyle-and-technology magazine, to be called first *Millennium*, and later *Wired*. In February 1992, they attended Wurman's TED conference and carried with them a prototype of their new magazine to show one of the conference's speakers, Nicholas Negroponte. Unlike Wolff and Kelly, Negroponte was impressed. He arranged meetings for them with a series of media moguls, including Henry Kravitz, S. I. Newhouse Jr., Michael Eisner, Ted Turner, Rupert Murdoch, and Christy Hefner, and all declined their requests for funding.⁹ Later that year, Negroponte himself became the magazine's first investor, ponying up \$75,000 in return for a 10 percent stake in the magazine and promising to write a monthly column as well. He also persuaded Charles Jackson, CEO of Silicon Beach Software, to invest another \$150,000 in the magazine.

With this, Rossetto and Metcalfe, together with the magazine's designers, John Plunkett and Barbara Kuhr, moved to San Francisco, started a conference on the WELL, and began seeking staff for the magazine. On the financial side, they created a series of business plans and began showing them to potential contributors. When they met with Bruce Katz, then head of the WELL, he referred them to Peter Schwartz. Schwartz in turn passed

them to Global Business Network cofounder Lawrence Wilkinson. Wilkinson invested both his own money and that of the Global Business Network in the magazine and introduced Rossetto and Metcalfe to bankers at the firm of Sterling Payot, who ultimately provided several hundred thousand dollars in funds. Wilkinson went on to become the magazine's chief financial strategist. On the editorial side, Rossetto and Metcalfe created another, more fully developed prototype of the magazine, complete with a glossy look and feel, flashy graphics, and actual stories. Up until he saw this prototype, Kevin Kelly had been watching Rossetto and Metcalfe from a distance, expecting them to fail. But, says Kelly, "The minute I saw the [new] prototype I knew it was going to work."¹⁰ For Kelly, *Wired* marked a logical extension of the work he had been doing at the *Whole Earth Review* and that others had been doing at *Mondo 2000*. Both of those publications had begun to merge lifestyle issues and technology, but always with the low-rent production values of underground periodicals. Finally, Kelly thought, here was a magazine that would get the attention that the *Whole Earth Review* and *Mondo* had both deserved. Kelly signed on as executive editor, and in June of 1992 he joined Rossetto, Metcalfe, and Wilkinson on the board of the newly formed Wired Ventures.

New Technology, New Economy, New Right

Even before they published their first issue, then, Rossetto and Metcalfe had stitched *Wired* into the social fabric of the Whole Earth world. They had found their financial strategist in the Global Business Network and a key editor in the *Whole Earth Review*; as the magazine ramped up, they would find many writers and ideas for stories in their conference on the WELL. Over time, these connections would link Rossetto's own long-standing antistatism to the New Communalist vision of an ideal social order born from the transformation of consciousness.

They would also connect both intellectual traditions with a series of extraordinary transformations in computing technology, the American economy, and American political life. By the time *Wired*'s first issue appeared in March of 1993, desktop computers had become common features of homes and offices nationwide. The cost of computing was plummeting. According to one economist, between 1987 and 1995, the price of computing power decreased an average of 14.7 percent a year; from 1996 to 1999, it fell 31.2 percent a year. Thanks to their licensing practices, Microsoft and Intel supplied software and hardware, respectively, for a rapidly expanding array of computer manufacturers, including Dell, Compaq, and Gateway. By 1995 Microsoft's Windows operating system had become a global standard.¹¹

The increasing availability of powerful small computers coincided with the privatization of the Internet backbone, a flowering of commercial networks, and a dramatic increase in public computer networking. In the early 1980s, the Internet backbone was government property. Managed by the Defense Department's Advanced Research Projects Agency (ARPA), it joined a set of operational and research networks, most of them connected to military projects. In the late 1980s, the number of academic users increased, and in 1990 ARPA transferred control over the Net to the National Science Foundation (NSF). ARPANET and NSFNET prohibited commercial traffic; but in the 1980s a series of commercial and alternative networks had also sprung up, such that by the late 1980s, millions of Americans were e-mailing one another, participating in online discussions, and posting information. Finally, in April 1995, the NSF relinquished control of the Internet backbone, facilitating the interlinking of commercial, alternative, and government-sponsored networks and the mixing of for-profit and not-for-profit uses across the system.¹²

By that time, another phenomenon had appeared on the Internet: the World Wide Web. Created in 1990 by Tim Berners-Lee and his colleagues at the Centre Européenne pour la Recherche Nucléaire (CERN), the Web took advantage of the Internet's information transfer protocols to create a new system of information exchange. Thanks to hyperlinks embedded in documents, as well as the new Universal Resource Locator (URL) system, users could navigate information in new and complex ways. For many, the Internet had long served as a system for the exchange of text messages. With the arrival of the Web, it became a way to publish information, to incorporate multimedia formats, and to quickly and easily connect previously discrete clusters of information.

At first, CERN distributed its Web software principally within the scientific community and Web use grew very slowly. Then, in 1993, a team led by Marc Andreessen, a staffer at the National Center for Supercomputing Applications (NCSA) at the University of Illinois, developed a new Web browser called Mosaic, which allowed users to embed hyperlinks in images for the first time and also permitted users to post color images within their Web pages. The NCSA made Mosaic available to the public in November 1993, just as *Wired* magazine's fifth issue was arriving on newsstands. Users downloaded forty thousand copies of Mosaic in the first month; by the spring of 1994, more than a million copies were in use. The rapid distribution of Mosaic in turn drove growth in the Web itself. In April 1993, the Web featured only 62 servers; by May of 1994, that number had ballooned to 1,248.¹³ In 1994 Andreessen left the NCSA to found a commercial browser manufacturer, Netscape. The Netscape browser, which was

faster, more secure, and easier to use, helped drive the rise of e-commerce, and in August of 1995, Netscape went public. Its shares doubled in value on the first day of trading.

Over the next five years, use of the Internet and the Web would grow astronomically, and as it did, speculators would bid up the share values of Internet-related stocks to extraordinary heights. Between 1995 and 1999, companies with limited (if any) actual profits saw their stock values grow by as much as 3,000 percent. By the end of the decade, shareholders would witness the inflation of the largest speculative bubble in American economic history. When the bubble first began to grow, Americans did in fact have reason for economic optimism. Just as the Internet and the World Wide Web were coming online, the American economy was enjoying a major expansion. From 1993 to 2000, Americans saw rapid growth in manufacturing output, investment, and worker productivity; at the same time unemployment and inflation sank to levels close to those of the prosperous 1950s.¹⁴

However, the growth did not derive from productivity increases brought about by the increasing use of computers and computer networks in business. Most growth was concentrated in the 12 percent of the American economy devoted to manufacturing durable goods, including computer hardware and peripherals. Although an increase in the manufacturing of computer hardware certainly boosted the economy overall, the deployment of computers per se did not. By the year 2000, 76.6 percent of all computers used in business were being used in retail and service firms; yet, though such firms accounted for about 75 percent of all business-oriented computer use, this sector of the economy had seen little in the way of productivity gain. Conversely, within the manufacturing sector that was almost exclusively responsible for economic growth in this period, the use of computers—as distinct from the manufacture of computer hardware—had very little measurable effect on productivity.¹⁵

Nevertheless, by the end of the decade, computers, telecommunications, and the Internet in particular had seized the public imagination. In part, some have suggested, this came about naturally, as individual users encountered the Internet for the first time. As Nigel Thrift has shown, however, by the end of the 1990s an entire circuit of stock analysts, journalists, publicists, and pundits had also emerged. They spun out a series of self-reinforcing prognostications, and as they did, analysts and investors appeared to come to a consensus: computers were bringing about a New Economy and perhaps even a long economic boom. New, more entrepreneurial forms of corporate organization, rapid investment in high technology, and the ability to corral the intangible knowledge and skills of employees—all seemingly

made possible by the suddenly ubiquitous computer and communication networks—were transforming America and perhaps even bringing an end to the business cycle itself. In 1999 even the exceptionally sober-minded chairman of the Federal Reserve, Alan Greenspan, had come on board. With his inimitable diction, he explained to an audience of bankers in Chicago that “a perceptible quickening in the pace at which technological innovations are applied argues for the hypothesis that the recent acceleration in labor productivity is not just a cyclical phenomenon or a statistical aberration, but reflects, at least in part, a more deep-seated, still developing, shift in our economic landscape.”¹⁶

This vision of a New Economy was accompanied by an ongoing swing to the right in American corporate and political life. Although Bill Clinton, a centrist Democrat, occupied the White House from 1993 to 2001, the era witnessed an extension of Reagan-era calls for the rollback of government entitlements and the deregulation of industry; there was also an increase in the visibility of the Christian right. The elections of 1994 ushered in the first Republican majority in both houses of Congress for forty years. Led by Newt Gingrich, the House of Representatives in the mid-1990s pushed for the downsizing of government and widespread deregulation—especially in the telecommunications sector. Together with Alvin Toffler, George Gilder, and technology journalist and entrepreneur Esther Dyson, Gingrich argued that America was about to enter a new era, one in which technology would do away with the need for bureaucratic oversight of both markets and politics. As Gingrich and others saw it, deregulation would free markets to become the engines of political and social change that they were meant to be.

Thomas Frank has termed this vision “market populism,” and as he has indicated, in the 1990s it depended on a particular reading of the Internet. If the market was to be a deregulated mechanism of political as well as economic exchange, the recently privatized circuits of the Internet, with their free-flowing streams of commercial and noncommercial bits, made a perfect rhetorical prototype of the market-populist ideal. By the end of the decade, the libertarian, utopian, populist depiction of the Internet could be heard echoing in the halls of Congress, the board rooms of Fortune 500 corporations, the chat rooms of cyberspace, and the kitchens and living rooms of individual American investors. At its most extreme, Frank suggested, this ever-present ideology depended on a cybernetic understanding of information. By the end of the decade, he wrote, more than a few Americans agreed: “Life is in fact a computer. Everything we do can be understood as part of a giant calculating machine. . . . the ‘New Economy,’ the way of the micro-chip, is writ into the very DNA of existence.”¹⁷

The Whole Earth at *Wired*

Frank and others understood the integration of computing, biology, and economics and its links to a rhetoric of political liberation as quintessentially 1990s phenomena. Yet, a close look at the history of *Wired* suggests that this rhetorical constellation emerged not simply alongside new communication technologies, nor exclusively among those who made and marketed those technologies, nor even in the 1990s. Rather, this particular version of what Kevin Kelly called the “computational metaphor” had been coming together for decades. Since the late 1960s, Stewart Brand and others associated with various Whole Earth publications had been linking information technologies to a New Communalist politics of personal and collective liberation. On the communes of the late 1960s, on the WELL of the 1980s, and even on Global Business Network retreats, information networks and social networks, biological systems and economic systems had seemed to mirror one another. It had all been “one,” so to speak, for some time. In the 1990s, however, the editors and writers of *Wired* transformed the long-standing Whole Earth synthesis of cybernetics and New Communalist social theory into a means of embracing figures such as Gilder and Gingrich. In the process, they legitimated calls for corporate deregulation, government downsizing, and a turn away from government and toward the flexible factory and the global marketplace as the principal sites of social change. And they did so using the collaborative editorial tactics, universal rhetoric, and interpersonal networks of the Whole Earth.

Editorially, *Wired* made no pretense of pursuing balance in either its point of view or its sources. At one level, Rossetto simply aimed to distinguish the magazine from its competitors. As he told a reporter for *Upside* magazine in 1997, “The mainstream media is not allowing us to understand what’s really happening today because it’s obsessed with telling you, ‘Well, on the one hand’ and ‘on the other hand’”; under conditions of digital revolution, Rossetto believed that a magazine could tell the truth—and achieve distinction—only by “not being objective.” At another level, though, *Wired*’s editorial practices grew out of its integration into the Whole Earth world. John Battelle, the magazine’s managing editor, had worked for two years at *MacWeek* and joined *Wired* after earning a master’s degree in journalism at the University of California, Berkeley. He later recalled the editorial process at *Wired* thus: “It was about networks, and everyone brought their own. I was on the WELL. Kevin was on the WELL. I was in the trade magazine world, so I brought that whole world over with me, all the writers, all the people, all the knowledge and all the players who I knew from that world. Kevin knew all the players from the Whole Earth world and the

WELL. And Louis brought in Europe and the global perspective, tying it all together.”¹⁸

Kevin Kelly agreed. When he was at *Wired*, he later said, he thought of himself as a “nonjournalist.” Kelly meant for *Wired* to be a forum for the various networks in which he circulated, as the *Whole Earth Review* had been. He thought of himself as “a convener of interesting ideas”—much like a conference host on the WELL.¹⁹ His job, he thought, was to stir up conversations and print them. For this reason, Kelly often allowed traditional professional boundaries to dissolve. As part of the editing process, for instance, he routinely allowed writers to share drafts of their stories with their sources. And when the magazine ran stories by and about members of the editors’ personal and professional networks, those relationships often went unacknowledged. For one example, although Peter Schwartz regularly contributed articles to *Wired*, and although the Global Business Network was the subject of a feature story, the fact that GBN had helped fund the magazine was never reported in its pages.

At the same time that they were working to break down the traditional journalistic wall between writers and their sources, the editors of *Wired* were using the WELL to break down barriers between the magazine and its audience and potential contributors. From the time Rossetto and Metcalfe established a *Wired* conference on the WELL, they used it to build interest in the magazine and a sense of ownership in it on the part of WELL regulars, and, ultimately, as a way to identify writers for the magazine. As the magazine’s paper issues hit the stands, the WELL hosted regular forums to discuss *Wired* articles, as well as forums for *Wired* contributors. Soon, *Wired* opened forums on other services, including Mindvox, Onenet, and AOL. The magazine also began distributing other articles online for free. In the early years particularly, contributors to these online forums often felt as though they part of the magazine.²⁰ And many were. Almost immediately, some of the WELL’s most prominent members, including Stewart Brand, Howard Rheingold, and John Perry Barlow, began writing for *Wired*.

To Rossetto and Metcalfe this made sense, since they saw WELL users as living the sort of forward-thinking, technocentric lives their magazine celebrated. Rossetto was fond of comparing *Wired* to *Rolling Stone*. “Rolling stone held a window up to this group [of rock musicians] for the rest of the world to see how innovative, smart and powerful this group was,” Rossetto explained. At the same time, “it held a mirror up to the group itself.” *Wired*, he said, wanted to do the same with the citizens of the WELL and others like them. Rossetto’s claim in this regard masks a somewhat more complex process, though. In a 1992 business plan, Rossetto and Metcalfe had

described their target audience to potential investors as “Digital Visionaries.” With annual incomes averaging \$75,000 a year, this group represented “The top ten percent of creators, managers, and professionals in the computer industries, business, design, entertainment, the media and education.”²¹ In the coming years, *Wired* reached this group with extraordinary success. Less than three years after the first issue appeared, for instance, when *Wired* was selling 300,000 copies a month, its readers were 87.9 percent male, 37 years old on average, with an average household income of more than \$122,000 per year. In a reader survey, more than 90 percent of subscribers identified themselves as either “Professional/Managerial” or “Top Management.”²²

Even though a number of WELL users certainly fell into this category, *Wired* was not, by and large, opening a window on the world of the WELL per se. Rather, its editors were using their links to the WELL and to a variety of other Whole Earth networks and organizations in order to conjure up and legitimate a particular social vision. In the pages of *Wired*, Whole Earth-affiliated organizations such as the WELL served as prototypes of a new and ideal form of networked sociability to which their readers might aspire. Over the course of its first five years, *Wired* ran lengthy features not only about the WELL, but also about the Electronic Frontier Foundation, the Global Business Network, and the Media Lab. The stories often focused on individuals who were also regular contributors to *Wired*, such as John Perry Barlow in the case of the Electronic Frontier Foundation and Peter Schwartz in the case of the Global Business Network. In addition to legitimating *Wired*’s own writers, such stories presented the organizations as prototypes of the sort of life that digital technologies were ostensibly bringing about for society at large. That life, in turn, represented the fulfillment of a revolution begun in the 1960s.

In June 1994, for instance, *Wired* ran Joshua Quittner’s profile of the Electronic Frontier Foundation (EFF), entitled “The Merry Pranksters Go to Washington.” The headline streamed across a full page, in one-and-a-quarter-inch hot pink type; underneath it, a little dotted arrow directed the reader to turn the page. There, filling the next two pages, stood the eight principals of the EFF, including Mitch Kapor, John Perry Barlow, Stewart Brand, and Esther Dyson. Across the image ran a single line of text, drawn from the article: “The EFF does something that Mitch Kapor has wanted to do for three decades—‘find a way of preserving the ideology of the 1960s.’” Never mind that only one of the assembled group—Brand—had actually been a Prankster. To Quittner and his editors, the analogy was clear: “Older and wiser now, they’re on the road again, without the bus and the acid, but dispensing many similar-sounding bromides: Turn on, jack in, get

connected.” Quittner centered much of the article around Barlow and Kapor and several times quoted them as they suggested that their current work was an extension of the 1960s consciousness revolution, undertaken with grown-up sobriety. As Kapor put it, “John and I are refugees from the 1960s, trying to make it as adults in the 1990s, understanding that transforming consciousness takes some doing.”²³

For the New Communalists, transforming consciousness had meant stepping outside party politics. To Kapor and Barlow in the 1990s, it meant heading to Washington. Quittner asserted that the EFF had developed an “Open Platform” proposal (essentially, a multipoint plan to facilitate interconnectivity across media) that had become a central element in Vice President Al Gore’s 1993 Information Superhighway plans. For the leaders of the EFF, Quittner implied, creating a highly interconnected digital network open to all was a way to create a countercultural ideal: the leveled, harmonious community, linked by invisible signals. In that sense, the EFF had taken up where the Whole Earth publications had left off. As Quittner put it, “The *Whole Earth Catalog* was a tool catalog. The EFF is about empowering people through the tool of networking.”²⁴ In a long passage pulled out of the text and stretched across two pages, EFF board member Esther Dyson explained, “The fundamental thing (the Net does) is to overcome the advantages of economies of scale . . . so the big guys don’t rule.” On the Net, she argued, people could “organize ad hoc, rather than get stuck in some rigid group.” Quittner summed up her argument this way: “The Net, the very network itself, is merely a means to an end. The end is to reverse-engineer government, to hack Politics down to its component parts and fix it.”²⁵

The urge to “hack” politics by bringing governance down to a manageable local level and by basing social integration on technologically facilitated forms of consciousness was one of the driving impulses behind the New Communalist movement. Now, however, the old hammer-and-saw-wielding, do-it-yourself ethos of the back-to-the-landers had been fused to the craft ethic of computer programmers. Much as Stewart Brand and his Whole Earth colleagues had done at the Hacker’s Conference of 1984, Quittner and Dyson joined the cultural legitimacy of the counterculture to the technological and economic legitimacy of the computer industry. Married to a libertarian longing for the reduction of government, Dyson’s Internet became an idealized political sphere in the image of the forms of organization pursued by the Merry Pranksters, USCO, and many communes—forms in which authority was distributed, hierarchies were leveled, and citizens were linked by invisible energies. The Internet became both a metaphor for such a system and a means to bring it into being.

In Quittner's article, the global Net also called to mind the local network of relationships in which the leaders of the EFF found themselves enmeshed. Quittner organized the piece around several miniature portraits of key EFF people. At each stage, he carefully emphasized their extraordinary mobility, their access to people in power, and their material success. In *The Electric Kool-Aid Acid Test*, Tom Wolfe took readers inside the garage where the Merry Pranksters painted their psychedelic bus. Quittner here took readers inside San Francisco's Bistro Rôti—"a cozily upscale place overlooking the bay . . . woodburning stove . . . valet parking . . . white Jaguar in front . . ."—for the EFF's quarterly board meeting. Diners included Bill Joy, founder of Sun Microsystems; David Liddle, head of Interval Research Corporation; *Wired*'s own Jane Metcalfe; and a handful of other Silicon Valley luminaries alongside the current board members. Like the Merry Pranksters in Wolfe's account, this new elite inspired a hush in onlookers: "Waiters and waitresses quietly remove the uneaten shrimp and satay and whisper to each diner: *Chicken, steak or fish? Hot from the wood stove . . .*" And like the Pranksters, the diners celebrated their historical importance. When Kapor introduced Barlow, Esther Dyson shouted, "Tell them how you travel, John!" Barlow replied, "Well . . . sometimes I travel by bicycle, sometimes by computer, and sometimes—like the day before yesterday—I travel by Air Force Two."²⁶ The other diners cheered, knowing that the vice president had invited Barlow on board to talk about Internet policy.

In the context of Quittner's story, Barlow's introduction represented a measure of the EFF's power to influence contemporary politics and, at the same time, a vision of a future world in which social life, technological life, and political life had been completely intertwined. Barlow's comments demonstrated that his material and immaterial networks overlapped. He traveled by computer and by Air Force Two, and his ability to do so modeled the mobility and flexibility of life in the leveled society that Esther Dyson argued digital networks were bringing about. Gathered in the warmth of the woodstove, the leaders of Silicon Valley and of the EFF also modeled the sort of informal politics said to take place on the Net. In fact, their obvious success and easygoing camaraderie seemed to mark the effects those politics could have on the rest of the world. Highly individual, smart, fun, they had come together in a room where, like master planners overlooking a map, they could view the landscape (or, in this case, seascape) far below. They were a new kind of elite, born out of the antihierarchical ethos of the 1960s and powerful in a manner that matched that ethos. And if readers simply went online, the article seemed to suggest, they too could share in that world.²⁷

The prototypical elements of “The Merry Pranksters Go to Washington” reappeared in *Wired*’s profiles of the Global Business Network, the Media Lab, and the WELL. In November 1994, for instance, journalist Joel Garreau, himself a member of GBN, described the Global Business Network as “a cause, a club, a conspiracy, and a collection of highly energetic particles aimed at bumping up against huge organizations with positive results.” Seen from one angle, Garreau’s GBN was simply a group of interdisciplinary and interpersonal networks that specialized in the promotion of group learning. Seen from another, it was an information system, a collection of people who were themselves little packets of information colliding with one another and with “huge organizations.” Perhaps, Garreau implied, the Global Business Network would work like Esther Dyson’s Internet and would transform its client organizations into inventive, problem-solving ad-hocracies. His sources reinforced this notion, as did the article’s cybernetic tropes. GBN staffer Eric Best, for instance, described the organization thus: “It’s a convention of curious kids. They want the opportunity and license to explore anything with the smartest people they can find. At a time of macro change, it’s a collection of magpies and blue jays that set up the screeching when a big animal moves in the forest—because the forest needs that.”²⁸ In Best’s view, GBN would play the role once assigned to the communes of the back-to-the-land movement. It would become an elite example of the sorts of organizations the world needed, a collection of magpies who might save the economic and social ecosystem in the face of rapid technological change.

These parallels between Whole Earth–related interpersonal networks, emerging digital networks, and “systems” more broadly construed, as well as the echoes of the cold war–era world-saving impulse of the New Communalists, also appeared in Katie Hafner’s 1997 portrait of the members of the WELL and in Fred Hapgood’s 1995 account of MIT’s Media Lab. After quoting leading WELL citizens describing the WELL as an “ecology” and as a “disembodied tribe,” Hafner slipped into nature metaphor herself.²⁹ Conflicts, she wrote, “seemed a necessary force of nature, like a periodic brushfire that works its destruction to seed nutrients into the soil.” Online system, disembodied community, the WELL’s interpersonal networks—in Hafner’s account, each mirrored every other, and together they were a self-contained system akin to the natural systems of the earth itself. Likewise, in a feature pinned to the Media Lab’s tenth anniversary, Fred Hapgood argued that the Lab’s “cultural variety gave it the outline of a complete society” and that “the relentless flood of projects made the place feel as if wherever it was going, it was getting there without losing a beat.”³⁰ As Hapgood pointed out, the Media Lab had missed two of the most important developments in

computer networking, HTML code and Web browsers. Yet, he argued, like the WELL, the Global Business Network, and the Electronic Frontier Foundation, the Media Lab was a prototype of an emerging world:

A decade after its inception, the lab serves as a model for the organization of technical research and the relation of research to industry. It is also a model for education, in which art and engineering are combined in a project-centered curriculum where students' work is reviewed by real-world experts instead of academic professionals. No doubt this model has limitations, but we live at a time when the old ideas on these issues are simultaneously rusting out. Perhaps the single biggest achievement of the last 10 years will turn out to be the Media Lab itself.³¹

The New Communalists Meet the New Right

In each of these articles, the writer depicted a networked organization that seemed to be living out a contemporary version of the tribal countercultural ideal and appeared to forecast the social potential of the digital networking technologies of the 1990s *in terms of* that model. These groups served as prototypes not only of ways to coordinate research or online conversation, but of ways to organize a life. In addition, they helped to legitimate calls for telecommunications deregulation and smaller government. *Wired* served not only as a platform on which Whole Earth–related organizations could be displayed as prototypes, but also as a forum in which New Right pundits and politicians, proffering a highly libertarian version of the social impact of digital technologies, could be integrated into the Whole Earth's story of world-saving countercultural revolution.

This role can be seen most clearly in *Wired*'s complex relationship with Esther Dyson, libertarian telecommunications analyst George Gilder, and House Speaker Newt Gingrich. Over the magazine's first two years, these figures became involved in a cycle of mutual legitimation. At *Wired*, Gilder and Dyson served variously as sources, subjects, and authors of stories, and in August 1995 Dyson interviewed Gingrich for a *Wired* cover story. These appearances in *Wired* took place, however, against a background of other collaborations. In August 1994 Gilder invited Dyson to Aspen, Colorado, for a conference sponsored by the Progress and Freedom Foundation, a think tank closely linked to Newt Gingrich. There, along with Ronald Reagan's former science adviser, George Keyworth, and Alvin Toffler, Gilder and Dyson lent their names to a document featuring what was arguably the decade's most potent rhetorical welding of deregulationist politics to digital technologies, "Cyberspace and the American Dream: A Magna Carta for the

Knowledge Age.”³² A year later, while Gingrich’s portrait graced the cover of *Wired*, Dyson and Gilder returned to the Aspen conference, taking with them John Perry Barlow, Kevin Kelly, and Stewart Brand, as well as bio-nomist Michael Rothschild and representatives from Microsoft, America Online, and Sun Microsystems.

In keeping with the Whole Earth’s editorial tradition, *Wired* magazine simultaneously facilitated and celebrated these encounters. As members of the Whole Earth network, the computer industry, and the Republican right began to meet in person, they also began to appear in the magazine. In and of themselves, these appearances conferred legitimacy on members of each group. *Wired* also served as a site where representatives of each of these communities could lend members of other communities elements of their own public standing. The technical community could declare Gingrich to be a “wired” politician; the highly visible Gingrich could declare the technical community to be central to the national interest and on the cutting edge of politics. The countercultural community, represented in person by Brand, Barlow, and to some extent Kelly (and, in the pages of *Wired*, represented graphically by the magazine’s neo-’60s layout and design), worked to legitimate the rising forces of technology and New Right politics as signs of the coming of a countercultural revolution.

This process took place over several years and depended for its success on editorial tactics first developed in the Whole Earth publications. George Gilder’s relationship with *Wired*, for instance, began when Kevin Kelly interviewed him in the magazine’s fourth issue. At first glance, Kelly and Gilder would seem to be an odd match. During the same decades when Kelly was wandering Asia with his backpack, Gilder was establishing a reputation as a right-wing pundit. In 1973 he wrote an article for *Harper’s* magazine in which he declared that “the differences between the sexes are the single most important fact of human society” and that “the drive to deny them—in the name of women’s liberation, marital openness, sexual equality, erotic consumption, or homosexual romanticism—must be one of the most quixotic crusades in the history of the species.” In 1974 the National Organization for Women declared him the Male Chauvinist Pig of the Year for the book that grew out of that article, *Sexual Suicide* (later republished as *Men and Marriage*). In 1981, just a few years before Kelly came to work for Stewart Brand, Gilder published a defense of supply-side economics entitled *Wealth and Poverty*. Critics and supporters alike called the book “the bible of the Reagan revolution,” and it shortly reached number four on the *New York Times* best-seller list.³³ Over the coming years, Gilder served up a volume of worshipful portraits of entrepreneurs (*The Spirit of Enterprise*, 1984), a celebration of technological miniaturization (*Microcosm*, 1989), and studies of

digital technologies as forces for the enhancement of individual liberty (*Life after Television*, 1990, and *Telecosm*, 2000). By the end of the 1990s, he would become famous as a promoter of telecommunications stocks, most notably Global Crossing—a company that went public in 1998 at nineteen dollars a share, saw its share price nearly triple within a year, and, only four years later, became the largest telecommunications company to go bankrupt in American history.

In the early 1990s, though, Gilder and Kelly were moving in the same high-tech circles. Both, for instance, had served as keynote speakers at the annual conferences on bionomics that Michael Rothschild had started in 1991. These conferences attracted executives from Silicon Valley as well as libertarians of various stripes (including John Perry Barlow, who spoke at one in 1992).³⁴ As an intellectual framework, bionomics offered a natural meeting point for representatives of the New Right, such as Gilder, and of the Whole Earth's cybernetic tradition, such as Kelly. For Kelly, the notion that natural and social systems could model one another had long made sense. For Gilder and others on the right, the notion that markets were "natural"—in the sense of inevitable and right—was virtually a mantra. For each, it was a small step to integrate computers into the analogy.

In his interview with Kelly, Gilder took this step with aplomb. "The Internet," Gilder explained, "is an exciting kind of metaphor for spontaneous order." That is, the Internet might model a biological or a social system, but wherever set, that system would be governed from within and would be well organized. According to Gilder, the Internet was also a trigger for a libertarian reorientation of government. As opposed to "top-down technologies" such as TV and telephones, digital technologies "put you in command again." Government had no role to play in this process: "The government always discovers a technology after its moment is passing," he intoned. "If you're a winner you don't go to the government."³⁵

By the middle of the interview, Gilder had begun to suggest that the Internet might be both a metaphor for a libertarian, free-market system and a sign of that system's inevitability. Kelly then picked up Gilder's thread and linked it explicitly to his own recently completed research on artificial life. Kelly suggested that the idea that the Internet would "eliminate hierarchy" might be a "myth, a utopian hope." Experiments with computers had shown that what appeared to be peer-to-peer systems in fact depended on "nested hierarchies." Gilder finessed the point: "The complexity of digital systems requires a hierarchical organization," he explained. "You need nested hierarchies. . . . So hierarchies do indeed exist. But they are ubiquitously distributed, which renders them an egalitarian force." In Gilder's comments, the hierarchical elements of computers became evidence for

their *antihierarchical* social effects. And those effects could be mind-boggling. Simply having access to a workstation granted a person “the power that an industrial tycoon commanded in the industrial era.”³⁶

By the end of their conversation, Kelly and Gilder had come together around the computational metaphor and used it to link several previously distinct ideas and social positions. Digital networks, which depend on all sorts of logical and electronic hierarchies to function, had become the emblems of the theoretically “level playing field” of the ideal free market. At the same time, the “nested hierarchies” of the machines served as symbolic stand-ins for local tycoons. The material power of tycoons had been virtualized; in Gilder’s account, to control information was to control the world. This sort of statement could make sense only if one assumed, in keeping with the universal rhetoric of cybernetics and its social Darwinist cousin, bionomics, that the biological and social worlds were no more than information and that humans were, in the words of Norbert Wiener, not “stuff that abides but patterns which perpetuate themselves.” And it was a very short step from the notion that the control of information makes one an industrial tycoon to the notion that the tycoons of the information industries should naturally control other systems. In his interview with Kelly, Gilder had set up an array of rhetorical mirrors. Biological, economic, and digital systems reflected one another; each should ideally be decentralized, deregulated, and ruled by a series of information tycoons; each of the tycoons in turn should be the master of his own local, temporary, nested hierarchy.³⁷

In *Wired*’s view, Gilder himself was both such a tycoon and something of a cultural revolutionary. In March 1996 Rossetto and Kelly put Gilder on the magazine’s cover. For the newsstand, the editors framed Gilder’s face in a cool neon dance-floor green; inside the magazine, they depicted him as a cyber-age Peter Pan, flying across a green sky, hair waving. Gilder was hip, young, and maybe a bit countercultural, even if he did wear a tie. He was also in touch with the machine. In his profile, Po Bronson compared the social and economic systems within which Gilder made his living as a consultant to the digital systems he studied. Much as other *Wired* writers had celebrated the members of the Electronic Frontier Foundation or the Global Business Network for their social connections, Bronson dwelled at length on Gilder’s hectic schedule of appearances, his migrations from tech company to tech company, and his twenty-thousand-dollar speaking fees. Gilder appeared to be a pattern of information, shuttling from node to node along a web of elite institutions. In case the reader missed the point, Bronson depicted Gilder literally speaking in the machine language of zeros and ones. When he met a new engineer, Bronson explained, Gilder and the engineer

would “go through this sort of cascade of language syntax, negotiating like two modems, trying to find the most efficient level of conversation they can hold.” In Bronson’s sample conversation, the engineer was named Steve:

GEORGE: Hi, nice to meet you. Hey, that’s a sweet access router over there.
 Wow, both Ethernet and asynchronous ports?
 STEVE: Yeah, check this baby out—the Ethernet port has AUI, BNC, and RJ-45 connectors.
 GEORGE: So for packet filtering you went with TCP, UDP, and ICMP.
 STEVE: Of course. To support dial-up SLIP and PPP.
 GEORGE: Set user User_Name ifilter Filter_Name.
 STEVE: Set filter s1.out 8 permit 192.9.200.2/32 0.0.0.0/0 tcp src eq 20.
 GEORGE: 0010110110001011100100110110000101010100011111001.
 STEVE:
 GEORGE: Really? Wait, you lost me there.³⁸

Read in the context of Kelly’s earlier interview and alongside Gilder’s own frequent contributions to the magazine in later issues, Bronson’s turning Gilder into a speaking computer represents a new level of legitimization for Gilder and his views. When Kelly interviewed Gilder, the conversation had revolved around the “computational metaphor” of cybernetics, and it linked that metaphor, and the Internet more generally, to a deregulated marketplace. Bronson’s profile placed Gilder himself *inside* the computational metaphor. By the end of the piece, it was hard to escape a cascade of conclusions: the Net modeled an ideal social, biological, political, and economic sphere; computers were the latest stage in the evolution of those spheres; computers also served as tools and analogies for a new and more highly evolved type of leader; George Gilder was one of those leaders. As in its profile of the Electronic Frontier Foundation, *Wired* had offered the freelance lifestyle of a high-profile consultant as a model of the independent lifestyle ostensibly becoming available to the digital generation as a whole.

A month after Kelly’s first interview with Gilder appeared in *Wired*, Paulina Borsook published a similar profile of Dyson. The story moved swiftly through Dyson’s biography—child of physicist Freeman Dyson, childhood friend of Alice Bigelow (daughter of Julian Bigelow, John Von Neumann’s engineer), former *Forbes* reporter and Wall Street stock analyst, later editor of the newsletter *Release 1.0* and hostess of the annual PC Forum conference. When it came to Dyson’s present career, however, the story slipped into information-system metaphors like those that appeared in Bronson’s profile of Gilder. Like Bronson’s Gilder, Borsook’s Dyson moved from company to company, “assimilating new ideas and retelling them to

those who can turn them into wealth.” She was a human node in an invisible network of information exchange. According to Borsook, she was somewhat singular and emotionally mechanical in her pursuits: “She often calls people ‘friendly’ or ‘nice,’” wrote Borsook, “meaning they have interesting ideas and are willing to share them.”³⁹ Like a computer, Dyson was “constantly cross-referencing and time stamping” her encounters: “What Esther does, in short, is provide a salon bound neither by time nor by space. Most of its habitués will never meet, but they all know Esther.”⁴⁰

Borsook’s notion of Dyson as a cross-referencing, time-stamping information system neatly blurred the distinctions between Dyson’s professional networks and the emerging digital networks of the Internet. Dyson appeared to be a computer; her invisible salon, a sort of cyberspace. In Borsook’s story, Dyson’s life as an entrepreneurial information worker and the emergence of digital networks became mutually legitimating mirrors of each other. Both were signs and products of the digital revolution under way. Borsook reminded her readers that this revolution was an extension of the countercultural revolution of thirty years before: “In spite of her libertarian leanings and her identification with the capitalist class, [Dyson] is in some ways the ultimate hippie. She has constructed a life that adheres to the ‘60s credo ‘Follow your bliss and the money will come.’”⁴¹

By the time she appeared in *Wired*, Dyson had become well integrated into the extended Whole Earth network. She was one of the earliest members of the Global Business Network, joining in 1988. Brand, a long-time admirer, later recalled that “She brought to business a sharp analytical mind, no end of energy, intelligence and a somewhat libertarian political frame but an extreme public service inclination.” Through the Electronic Frontier Foundation, Dyson had remained in close contact with Brand, Barlow, Kelly, and others. In 1995 she would go on to become chairman of the board of the Electronic Frontier Foundation, and in 1998 she would become chairman of ICANN, the international nonprofit corporation responsible for assigning domain names and addresses on the Internet. At the same time, however, Dyson was finding her way into the center of Republican power. In 1994 George Gilder arranged for Dyson to be invited to a conference in Atlanta entitled “Cyberspace and the American Dream,” sponsored by the Progress and Freedom Foundation (PFF). “I didn’t know much about the foundation,” Dyson later explained. “But they mentioned that, along with George, Alvin and Heidi Toffler would be there. That was good enough for me. Oh yes. And Representative Newt Gingrich, too.” In the summer of 1994, Dyson flew to Atlanta. At a small planning meeting for the conference, she met Gingrich for the first time. He impressed her with his poise, his knowledge of the Net, and most of all with the way in which he saw the

Net not so much as a way to make current government structures more efficient, but as an agent of political change in its own right. These views accorded well with her own, but the political terrain felt new and a little strange. “I walked into a world I didn’t understand,” she later recalled. “I discovered that the document I was to help draft was to be a manifesto.”⁴²

The manifesto that Dyson went on to coauthor extended the cybernetic and countercultural analogies current in the social worlds of the Whole Earth and *Wired*, linked them to a libertarian political agenda, and ultimately used them as symbolic resources in support of the narrow goal of deregulating the telecommunications industry. The “Magna Carta for the Knowledge Age” represented the combined efforts of four authors: Esther Dyson, George Gilder, Alvin Toffler, and George Keyworth, who was Ronald Reagan’s former science adviser and a current PFF staffer. The document’s preamble opened with a grand flourish: “The central event of the 20th century is the overthrow of matter. . . . The powers of mind are everywhere ascendant over the brute force of things.” On the one hand, this triumph of the immaterial reflected Alvin Toffler’s claim that a “Third Wave” of socioeconomic change was sweeping the world. In the first wave, farming and manual labor dominated the economy; in the second, machines and mass production ruled the land. Now, the authors wrote, echoing Daniel Bell and other theorists of postindustrial society, “the central resource is actionable knowledge.”⁴³ On the other hand, the preamble linked Toffler’s framework to the countercultural revolution of three decades before. After all, what had LSD users hoped to accomplish, if not the “overthrow of matter” by the “powers of mind”? This hope also reflected Norbert Wiener’s older, early cold war hope that somehow the powers of mind represented in computers could contain the “brute force” then represented by the massed armies of East and West.

As the manifesto progressed, so did the rhetorical commingling of these historical streams. Cyberspace, the authors explained, was “more ecosystem than machine”; it was “a bioelectronic environment that is literally universal.” Systems metaphors collided apace: like Gilder’s first interview at *Wired*, or like Kevin Kelly’s book *Out of Control*, the “Magna Carta” argued that computer systems and ecosystems modeled and interpenetrated one another. They also modeled the land of America itself: “The bioelectronic frontier is an appropriate metaphor for what is happening in cyberspace, calling to mind as it does the spirit of invention and discovery that led ancient mariners to explore the world, generations of pioneers to tame the American continent, and, more recently, to man’s first exploration of outer space. . . . Cyberspace is the land of knowledge, and the exploration of that land can be a civilization’s truest, highest calling. The opportunity is now

before us to empower every person to pursue that calling in his or her own way." This invocation of the "frontier" mythos linked the cybernetic and countercultural rhetoric of the preamble to two constituencies: the lawmakers of Washington, D. C., and the back-to-the-landers of three decades earlier. In Washington, the metaphor of the frontier had long been used to justify political action—particularly the disposition of military force and the development of new technologies. In the wake of World War II, Vannevar Bush himself had justified the pursuit of science and technology as a quest to explore an "endless frontier."⁴⁴ In the 1960s, of course, many now-middle-aged lawmakers had grown up with John F. Kennedy's celebration of the New Frontier. For former New Communalists, this frontier rhetoric suggested that the computer and telecommunications industries represented an extension of their own youthful efforts. Thirty years earlier, the commune-based subscribers to the *Whole Earth Catalog* had dressed up in the archaic cowboy hats and ankle-length dresses of the nineteenth century and headed out into the Southwest to build their encampments. Today, the "Magna Carta" suggested, echoing the postcountercultural rhetoric of *Wired* magazine, John Perry Barlow, and the Electronic Frontier Foundation, they need only boot up their computers and head out into cyberspace.

This frantic mingling of biological, digital, and frontier metaphors marked not only a collision of ideas, or even of historical thought-streams, but of communities of interest. Thrown together in Atlanta, the four authors of the "Magna Carta" had pooled the symbolic resources of the various communities they represented and created a contact language. Broadly speaking, this language served to facilitate collaboration across the groups it interconnected. Having agreed that computing was a "new frontier," for instance, former hippies, young computer technologists, and government regulators could claim a common rhetorical ground on which to pursue their individual interests.

In the "Magna Carta," though, this contact language quickly came to serve a much narrower agenda. As Richard Moore has pointed out, the "Magna Carta" argued that digital technologies would enhance individual liberty, only to then confuse individual freedom with corporate deregulation. Cyberspace belonged to "the people," argued Dyson, Toffler, Gilder, and Keyworth, and as such, should be governed by them. Yet, thanks to the rhetorical confusion of cyberspace and the marketplace and, particularly, of cyberspace with the computing and telecommunications industries, the notion of returning cyberspace to its owners took on an entirely new connotation. "The most pressing need," explained Dyson and her colleagues, "is to revamp the policies and programs that are slowing the creation of cyberspace. . . . Indeed, if there is to be an 'industrial policy for the knowledge

age,' it should focus on removing barriers to competition and massively deregulating the fast-growing telecommunications and computing industries."⁴⁵ What is more, it should allow "much greater collaboration between the cable industry and phone companies." In a twist of logic reminiscent of George Gilder's comments to Kevin Kelly on "nested hierarchies," the document went on to argue that "obstructing such collaborations"—and, presumably, the near-monopolies that could result—"is socially elitist."⁴⁶ With a spectacular mix of hubris and hyperbole, the authors asserted that since digital technologies drove egalitarian empowerment, by definition, to restrain their technological development (and the empowerment of telecommunications and cable companies) would be to resist the forces of history, nature, technology, and American destiny all at once.

These arguments helped set the stage for the first major rewriting of American telecommunications policy in sixty years. By the end of 1994, Newt Gingrich and his insurgent Republicans had seized control of the Congress; almost immediately they launched a campaign to deregulate the telecommunications industry. With the *Telecommunications Act of 1996*, they succeeded. As the act was being developed, the "Magna Carta" helped make clear the House Speaker's own position and offered a justifying logic for the deregulation of the largest players in the industry. Although the act would ultimately reach out in a number of ways to noncorporate stakeholders, retaining universal service provisions, for instance, and including provisions in support of small entrepreneurs, it also freed massive telecommunications firms and cable companies to expand their operations dramatically. Moreover, as Patricia Aufderheide has explained, it enshrined in law the notions that undergirded the "Magna Carta." In the *Telecommunications Act of 1996*, as in the "Magna Carta," technologies—particularly communication technologies and the Internet—were seen as models of open markets and an open political sphere and at the same time as tools with which to bring them about. In that sense, the act treated the interests of the marketplace and those of the public as if they were fundamentally synonymous.⁴⁷

Though she may have felt somewhat awkward when she first entered Gingrich's realm, Dyson returned for a second conference the following year. Entitled "Aspen Summit: Cyberspace and the American Dream II," this meeting took place in Aspen, Colorado, and was again sponsored by the PFF. This time, the PFF extended invitations not only to Dyson, Toffler, and Keyworth, but also to John Perry Barlow, Stewart Brand, Kevin Kelly, and executives from Microsoft, America Online, and Sun Microsystems. Corporate sponsors of the event paid \$25,000 to attend (other visitors paid \$895), and many were unhappy. "If these people are opinion leaders, maybe I'm stuck in a Second Wave paradigm," griped Christopher C. Quarles III,

manager for emerging markets at AT&T.⁴⁸ Brand found himself on a panel reminding fellow spokesmen of the government's central role in developing the digital technologies that they claimed the government should now step away from.⁴⁹ If the "Aspen Summit" was intended to unite the technology industry, representatives of the San Francisco Bay area counterculture, and Republican Washington, it failed.

Nevertheless, though that meeting of the minds did not take hold in the mountains, it found a home in *Wired*. While the summiteers were meeting in Aspen, the August 1995 issue of *Wired* convened an interview between Esther Dyson and Newt Gingrich. In it they engaged in many of the rhetorical flourishes that characterized the "Magna Carta." Together they depicted the Internet as a model of an ideally decentralized and in many ways de-governmentalized society, and as a tool with which to bring that society about. As Dyson and her coauthors had done in the "Magna Carta," Gingrich compared the digital revolution to the birth of the American nation. In the interview, however, he extended that vision to include the social agenda of his own, then-insurgent party. Gingrich and the House Republicans had come to power carrying with them a multipoint program called the *Contract with America*. The *Contract* offered a blend of conservative social politics (welfare reform, anticrime legislation, promarriage tax policies) and laissez-faire business policy (corporate deregulation and tax reductions). In his interview with Dyson, Gingrich linked the Internet to both. "This is a society permeated by a belief that we have a mission, that our mission relates to God, and that our powers relate to God," he declared.⁵⁰ To settle the "bio-electronic frontier" he seemed to imply, was a divine mission, not unlike the settling of America some two hundred years earlier. And if that was true, then the Republicans themselves represented the vanguard of a new kind of society—one that would be more technologically savvy, but also more religious and more conservative. Toward the end of the interview, Gingrich hammered the point home by virtually restating the key points of the Republicans' *Contract with America*:

We have to do nine things in parallel, which is complicated. We have to re-new American civilization at a core-values level. We have to do everything we think we are doing to compete in a world market so we're economically sufficient. We have to make the transition to the information age. We have to replace welfare with a very different set of values and structures. We have to decentralize power out of Washington and ideally out of government to some extent. Everything we do at the federal level ought to be the best in the world, or we shouldn't be doing it. We need to balance the budget for fiscal long-term reasons that are very real in terms of baby boomers' retirement, in terms of

our kids' lives. We need to reestablish physical safety against drugs, violent crime, and foreign attacks. And finally we have to lead the planet. We're the only country capable of leading the human race. And we've got to do all nine of those simultaneously. Life's complicated.⁵¹

In her introduction to the interview, Esther Dyson expressed reservations about Gingrich's social politics, explaining, "I like his ideals—but not necessarily the people who espouse them. Or the society that will result from them."⁵² But by the end of her interview, the doubts seemed to have washed away. Dyson and Gingrich clearly spoke the same language—the language of the "Magna Carta." Moreover, for regular readers of *Wired*, their encounter came at the end of a long series of articles in which the cybernetic, countercultural, and deregulationist strains of their rhetoric had already been legitimated. Their conversation and its rhetoric also reflected a series of earlier encounters between the Whole Earth community, the technological community, and the corporate community. By the time Dyson interviewed Gingrich, the notion of business as a source of social change, of digital technology as the tool and symbol of business, and of decentralization as a social ideal were well established in the pages of *Wired* and in its networks of contributors. So too was the idea that the digital revolution represented an extension of the countercultural revolution. From here, it took little imagination to guess that perhaps the Republican "revolution" of 1994 might itself be riding the same "Third Wave."⁵³

The Internet as the New Millennium

In the end, Newt Gingrich's appearance on the cover of *Wired* signaled the high-water mark of the alliance between the techno-libertarians of the computer industry, the former counterculturalists of the San Francisco Bay area, and the social conservatives of the New Right. As the failure of the second "Cyberspace and the American Dream" conference suggested, the apparent similarity between Newt Gingrich's Republican agenda and Esther Dyson's vision of post-Internet politics hinged as much on shared rhetoric as on shared material interests. In the late 1990s, though, as the stock market began its final ascent toward its end-of-the-decade peaks and as investors clamored for shares in Internet stocks, that rhetoric reappeared. In 1997 *Wired* published two articles that together linked the cybernetic thought styles and countercultural social ideals of the Whole Earth world to millenarian claims for the emergence of a New Economy. Both articles would be developed into books, and both would be among the most widely cited documents to argue that thanks to the Internet, the laws of twentieth-century economics,

not to mention the hierarchies of twentieth-century bureaucracy, had been left behind.

The first of these articles appeared in July 1997. The cover of *Wired* trumpeted the piece: the magazine's designers centered a picture of the earth against a bright yellow background, echoing the covers of the *Whole Earth Catalog*. Over the green continents and blue oceans of the globe, they drew an early 1970s smiley face, chewing the sort of daisy long-haired protesters had famously slipped into the rifle barrels of soldiers at the 1967 March on the Pentagon. Even as its iconography pointed back toward the counter-culture, the cover's text suggested that a new revolution was afoot. "THE LONG BOOM," it proclaimed, was under way: "We're facing 25 years of prosperity, freedom, and a better environment for the world. You got a problem with that?"

The article itself claimed to be a "positive scenario" of the future.⁵⁴ Written by Global Business Network president Peter Schwartz and GBN staffer Peter Leyden and entitled "The Long Boom: A History of the Future, 1980 – 2020," the article argued that two long-term historical streams had merged. The first was technological. The computer and telecommunications networks of the 1990s were only the beginning. Soon biotechnology and nanotechnology would come online and, in their wake, a form of technology much sought after on the communes of the 1960s: alternative energy. The second stream was social. A new "ethos of openness" had taken root, wrote Schwartz and Leyden, in America and abroad. Characterized by "the relentless process of globalization, the opening up of national economies and the integration of markets," the new ethos spoke directly to the market populism of the late 1990s: in Schwartz and Leyden's view, deregulation of international markets represented the opening up of international politics.⁵⁵ Yet it also spoke to the dreams of those who had grown up in the 1960s. In their imaginary year 2000, they wrote, "Optimism abounds. Think back to that period following World War II. A booming economy buoyed a bold, optimistic view of the world: we can put a man on the Moon, we can build a Great Society, a racially integrated world. In our era we can expect the same." That era would meld the technological achievements of the New Frontier to the social ambitions of the New Communalists. In the year 2000, the bureaucracies of the cold war era would be "flattened and networked through the widespread adoption of new technologies."⁵⁶ In their place would arise "a new civilization, a global civilization, distinct from those that arose on the planet before." It would be a civilization marked by a singular understanding: "We're one global society, one human race."⁵⁷

In Schwartz and Leyden's article, and in the book that grew out of it, the Internet became a tool with which to fulfill both the cultural ambitions of

the New Communalists and the technological ambitions of the nation they sought to change. Like the space program of the 1960s, the Internet had revealed that the world was a single whole. And like the drugs of that era, it was linking the minds of individuals into a new, collaborative and geographically distributed civilization. Moreover, they wrote, the sudden rise of the Internet and the World Wide Web and, alongside them, the transformations in corporate life and the run-up in the stock market, were simply tastes of things to come.

Two months after “The Long Boom” appeared in *Wired*, Kevin Kelly amplified its conclusions and linked them to the social and intellectual networks he had brought together in his book *Out of Control*. In an article entitled “New Rules for the New Economy,” and in a book of the same name shortly thereafter, Kelly argued that digital networks and networked forms of economic activity would open a new era in human life. Like contemporary pundits such as George Gilder and John Hagel, a corporate consultant and author of the widely read *Net Gain*, Kelly argued that the rise of the Internet was driving a shift toward networked forms of economic and social life. But he went on to embed the shift in a cybernetic rhetoric and to claim that it was evidence for the imminent fulfillment of a New Communalist dream.

Almost fifty years earlier, Norbert Wiener’s vision of the world as an information system seeking homeostasis had offered cold war Americans a framework with which to imagine their own survival in a nuclear era. In Kevin Kelly’s work, however, that vision offered readers a glimpse of a new and more turbulent renewal:

Silicon chips linked into high-bandwidth channels are the neurons of our culture. Until this moment, our economy has been in the multicellular stage. Our industrial age has required each customer or company to almost physically touch one another. Our firms and organizations resemble blobs. Now, by the enabling invention of silicon and glass neurons, a million new forms are possible. Boom! An infinite variety of new shapes and sizes of social organizations are suddenly possible. Unimaginable forms of commerce can now coalesce in this new economy. We are about to witness an explosion of entities built on relationships and technology that will rival the early days of life on Earth in their variety.⁵⁸

Mind and computation, economy and nature, the corporation and the individual—for Kelly, all mirrored one another, linked by the universal rhetorical logic of cybernetics and by the New Communalist hope that new, non-hierarchical social forms might arise thanks to technologies of consciousness.

In the late 1990s, Kelly also saw these new forms as a business opportunity: “Those who obey the logic of the net, and who understand that we are entering into a realm with new rules, will have a keen advantage in the new economy.” By the end of the decade, millions of Americans were investing their savings in Internet companies, very much in the belief that the economy and perhaps even humanity as a whole had entered a new era. Young engineers were migrating to the hubs of digital innovation as fast as they could. In the industrial-era lofts south of Market Street in San Francisco and in the narrow corridors of Manhattan’s Silicon Alley, twenty-something marketers pulled their six-hundred-dollar Herman Miller chairs around hand-hewn oak and redwood tables and plotted something called “web strategy.” More than a few began to imagine themselves as bits of talent and information swirling in the currents of a knowledge economy, their own careers tied to their ability to divine its rapidly changing laws.⁵⁹ Corporations reconfigured offices to facilitate flexible work, programmers camped in their companies’ open-all-night offices, and day after day, financiers, technologists, and ordinary Americans checked the financial pages for signs that the future was still dawning.

However, even as optimism peaked in its pages and among its readership, *Wired* magazine began to stumble. Since 1993 *Wired*’s investors had put up a total of \$40 million. As of January 31, 1997, *Wired* and its associated ventures had lost some \$50 million—despite taking in as much as \$17 million in advertising in 1996 alone.⁶⁰ In part, these losses reflected Louis Rossetto’s extraordinary ambition. No sooner had the magazine begun to appear on newsstands than Rossetto and his team began to expand into online ventures, book publishing, television production, and multilingual overseas editions of the magazine.⁶¹ That ambition in turn led Rossetto and his team to try to capitalize on the magazine’s reputation. In May of 1996, they did what so many Internet start-ups were doing: they hired Goldman Sachs to take them public. Most magazine and publishing companies typically sell at three times their book value. At this rate, *Wired* should probably have sold for between \$6 million and \$10 million.⁶² Goldman Sachs floated an initial public offering that valued *Wired* Ventures at \$447 million. Had it been accepted, Louis Rossetto alone would have pocketed \$70 million. When they could not find enough takers at that price, Goldman Sachs withdrew the IPO. In September of 1996, they tried again. This time they valued the firm at \$293 million. Even at this revised rate, *Wired* would have been valued more highly than 92 percent of the five thousand largest publicly traded companies in America at the time.⁶³

Perhaps Goldman Sachs had been hoping that investors would mistake *Wired* magazine for the technological “revolution” it covered. After all,

Wired's editors had long conflated the success of their interpersonal networks with the power of emerging networking technologies. If so, they were out of luck. Goldman Sachs found itself forced to cancel the second IPO as well, for lack of interest. *Wired* continued to lose money, and in July 1997, just as *Wired's* cover heralded the arrival of the Long Boom, *Wired's* investors forced Louis Rossetto to step down as chief executive officer of Wired Ventures. Five months later, he left the staff of the magazine altogether; soon thereafter, Kevin Kelly followed suit.

Not long after this, the stock market's dot-com bubble began to leak and then suddenly burst. *Wired's* techno-libertarian optimism would live on, as would the magazine itself. But for most Americans, the "Long Boom" was over.

The Triumph of the Network Mode

Looking back on the dot-com bubble's spectacular collapse, we can be tempted to dismiss the millenarian claims that surrounded the Internet in the 1990s as little more than the cunning hype of those who stood to profit from the building of broadband pipelines, the sale of computers, and the distribution of soon-to-be-worthless stock. But that would be a mistake. Although Kevin Kelly, Peter Schwartz, and *Wired* magazine certainly helped fuel the raging optimism of the period, their technoutopian social vision in fact reflected the slow entwining of two far deeper transformations in American society. The first of these was technological. Over the previous forty years, the massive, stand-alone calculating machines of the cold war had become desktop computers, linked to one another in a vast network of communication that reached into almost every corner of the civilian world. This shift in computing technology took place, however, alongside a second, cultural transformation. In the late 1950s, Stewart Brand and others of his generation had come of age fearing that they would soon be absorbed into an unfeeling bureaucracy, a calculating, mechanical form of social organization that had brought humankind to the edge of nuclear annihilation. Over the ensuing forty years, their attempts to find an alternative to this grim vision of adulthood saw them push back the boundaries of public life and make room for styles of self-expression and collective organization that had been taboo in much of cold war America.

By the late 1990s, Brand and his Whole Earth colleagues had repeatedly linked these technological and cultural changes and in the process had helped turn the terms of their generational search into the key frames by which the American public understood the social possibilities of computers and computer networking. Thanks in no

small part to Brand's work at the *Whole Earth Catalog* and later at *Rolling Stone*, desktop computers had come to be seen as "personal" technology. In keeping with the New Communalist ethos of tool use, they promised to transform individual consciousness and society at large. Thanks to the citizens of the WELL, computer-mediated communication had been reimagined in terms of disembodied, communal harmony and renamed virtual community. Cyberspace itself had been reconfigured as an electronic frontier. Finally, in the 1990s, the social and professional networks of the Global Business Network and *Wired* seemed to suggest that a new, networked form of economic life was emerging. Because of computer technologies, their example implied, it was finally becoming possible to move through life not in hierarchical bureaucratic towers, but as members of flexible, temporary, and culturally congenial tribes.

In all of these ways, members of the Whole Earth network helped reverse the political valence of information and information technology and turn computers into emblems of countercultural revolution. At the same time, however, they legitimated a metamorphosis within—and a widespread diffusion of—the core cultural styles of the military-industrial-academic technocracy that their generation had sought to undermine. In the imagination of the young Stewart Brand and others like him, and in the popular imagination even now, the middle-aged men who ran the corporations, universities, and governments of the cold war had found themselves locked into rigid roles. Their hands ached from years on the corporate ladder, and their souls had begun to wither beneath their suits. But during those same years, throughout the military-industrial-academic complex responsible for developing America's defense technologies, a far more collaborative style was emerging. Interdisciplinary, entrepreneurial, project-based, this new style thrived not only on government funding, but on the rhetoric of information and systems theory as well. By the late 1990s, both the highly flexible, networked cultural style of this research world and its dependence on informational metaphors had migrated far from the weapons laboratories and planning institutes of the cold war defense establishment. Like computers themselves, the culture and rhetoric of collaborative cold war research had become standard features of corporate and governmental life, and they remain so today.

In that sense, Stewart Brand and the Whole Earth network not only reconfigured the cultural status of information and information technologies as they moved from the government-funded, military-industrial research world into society at large; they also helped legitimate a parallel migration on the part of that world's cultural style. Moreover, they did so by embracing the cybernetic theories of information, the universal rhetorical techniques, and the flexible social practices born out of the interdisciplinary

collaborations of World War II. Like the designers of that era's weapons-research laboratories, Brand and his colleagues created network forums in which members of multiple social and technical communities could come together, collaborate, and, in the process, build shared understandings of their collective interests. Expressed first in local contact languages, these understandings were repeatedly exported from the forums themselves, either by forum members or by professional journalists in attendance. Like the laboratories that first gave rise to cybernetics, however, the forums produced more than new bits of rhetoric. They also produced new social networks and, in Brand's case, new information systems, such as catalogs, meetings, and online gatherings. These systems in turn hosted and helped to create new social and professional networks and at the same time modeled the networks' governing ideals.

By the 1990s, each of these elements had come to play an important role in building the rhetorical and social infrastructure on which the technoutopianism of the decade depended. But they also represented a new, networked mode of organizing the production of goods, information, and social structure itself. Fifty years earlier, across the military, industry, and academe, the dominant mode of organizing work was bureaucratic. Universities, armies, corporations—outside their research laboratories and designated think tanks—all featured vertical chains of command, long-term employment prospects, clear distinctions between individuals and their professional positions, firm boundaries between the organization and the outside world, and reward systems based on some combination of merit and seniority.¹ By the end of the twentieth century, however, these bureaucratic organizations had begun to lose their shape. In many industries today, and in some parts of military and academic life as well, hierarchies have been replaced by flattened structures, long-term employment by short-term, project-based contracting, and professional positions by complex, networked forms of sociability.²

Even as they decoupled computers from their dark, early 1960s association with bureaucracy, then, Brand and the Whole Earth community turned them into emblems not only of New Communalist social ideals, but of a networked mode of technocratic organization that continues to spread today. In that way, they helped transform both the cultural meanings of information and information technology and the nature of technocracy itself.

The Counterculture That Wasn't

With this history in mind, it is time to revise our understanding of both the counterculture of the 1960s and its relationship to the rise of postindustrial

forms of production and culture. Since the 1960s, scholars and journalists alike have tended to entangle the New Communalist movement and the New Left. Focusing on the fashions, music, and drug use common to both, critics have suggested that the two movements merged in one of two ways. Some have pointed to the New Left's embrace of new cultural styles in the late 1960s and suggested that that cultural turn helped corrode its political ambitions. Others have elided this moment and simply argued that the New Left was a particular manifestation of an otherwise unitary phenomenon called "the counterculture." In both cases, historians and sociologists, and particularly those interested in the relationship between the counterculture and information technologies, have tended to take the youth movements of the 1960s at their word and to argue that they did in fact represent an alternative to the military-industrial-academic culture of the cold war.

The history of Stewart Brand and the Whole Earth community suggests that this was not entirely the case. Even as the Free Speech Movement and the New Left explicitly confronted military, industrial, and academic institutions, the bohemian artists of cold war Manhattan and San Francisco, and later the hippies of Haight-Ashbury and the youthful back-to-the-landers, in fact embraced the technocentric optimism, the information theories, and the collaborative work style of the research world. Fully in keeping with the scientific ethos of the era, young members of the New Communalist wing of the counterculture, along with many in the New Left, imagined themselves as part of a massive, geographically distributed, generational *experiment*. The world was their laboratory; in it they could play both scientist and subject, exploring their minds and their bodies, their relationships to one another, and the nature of politics, commerce, community, and the state. Small-scale technologies would serve them in this work. Stereo gear, slide projectors, strobe lights, and, of course, LSD all had the power to transform the mind-set of an individual and to link him or her through invisible "vibes" to others. Thus changed, these new individuals could in fact complete the mission so long entrusted to the panjandrum of the military research community: saving the world. If twentieth-century bureaucracy had brought mankind to the edge of destruction, the commune-dwelling readers of the *Whole Earth Catalog* hoped their own example might return human beings to a new state of integration—psychological, techno-social, natural.

The New Communalist celebration of information, technology, and experimentation has two implications, one for our understanding of the roots of postindustrial society and another for our understanding of the counterculture's role in the spread of both computing and the networked mode of production. Since the early 1970s, a series of sociologists and geographers have chronicled the growth of a new, knowledge-based form of economic

production.³ Their descriptions of the forces driving this shift and of its likely consequences have varied, largely in synch with technological and economic developments occurring as they wrote. Yet, despite their differences, these scholars have tended to agree that, starting sometime in the late 1960s or early 1970s, a postindustrial mode of development emerged as a dominant force in society.⁴ Within this mode, as Daniel Bell put it in his early and still-influential 1973 account *The Coming of Post-Industrial Society*, “theoretical knowledge” would serve as the “axial principle” of production.⁵ Under the industrial regime, he argued, major technological innovations such as telegraphy and aviation had arisen from individual tinkering. By contrast, under the post-industrial system then emerging, new technologies such as chemical synthesis had come about as a result of systematic scientific research. In the future, he explained, this trend would accelerate. Scientists and researchers would work collaboratively to apply systematic knowledge to complex problems. They would produce both new goods and new knowledge, and as they did, their status in society would rise. As they acquired increasing social power, suggested Bell, bureaucratic hierarchies would begin to crumble, to be replaced by the leveled social structures of the research world.

Analysts have often argued that the shift to knowledge-based forms of production and flatter forms of organization either began or sped up dramatically at about the time Bell was writing. However, the history of Stewart Brand and the Whole Earth group serves as a reminder that many of the qualities associated with postindustrial society and its subsequent analytical incarnations in fact appeared earlier, in the military-industrial-academic research collaborations of World War II and the cold war.⁶ As historians of science have demonstrated, the government-sponsored research projects first created to help win World War II also saw the deployment of systematic knowledge across disciplines on an enormous scale. Tinkers did not design radar technologies or atomic weaponry; these technologies grew out of the gathering of interdisciplinary teams of scientists, engineers, and administrators. Though housed and funded by a massive bureaucracy, these teams did not stand on status and position; rather, they worked collaboratively, within a relatively flat social structure. In part, that structure grew out of the need to take a comprehensive, systemic approach to weapons development, one that could see men and machines as twinned elements of a larger combat apparatus. And in part, that flexible, interdisciplinary mixing helped spawn a rhetoric of systematic knowledge (cybernetics) and the tools with which to model and manage such knowledge (computers).

In other words, by the time Daniel Bell wrote *The Coming of Post-Industrial Society*, theoretical knowledge had already been serving as the central principle of military research and military-industrial production for some

thirty years. Perhaps partially for this reason, Bell argued that “the decisive social change taking place in our time . . . is the subordination of the economic function to the political order.” As subsequent analysts such as David Harvey and Manuel Castells have convincingly demonstrated, Bell was wrong on this point. The theoretical knowledge, the collaborative work styles, and the information technologies associated with government-sponsored research and science have indeed become increasingly important elements of society. Yet they have acquired that importance first and foremost in the economic sector. Harvey and Castells have each confirmed that knowledge, broadly construed, has become a central element in the production of new goods and services. As computers and computer networks have come online, scholars have in turn increasingly shown how these technologies have amplified and accelerated the impact of knowledge and information on the production process.⁷ A variety of sociologists have likewise confirmed Bell’s suggestion that alongside the rise of knowledge and information as key elements in the production process, a corresponding corrosion of corporate bureaucracy would occur. In many industries, vertical chains of command with clear reporting structures have indeed given way to more leveled forms. Bureaucracies certainly still exist, but increasingly, and particularly within knowledge-intensive and high-technology industries, networks rather hierarchies are becoming key forms of organizing production.

Over the past fifty years, then, the knowledge-based principles of production, the organizational styles, and the information technologies of the military research laboratory have in fact proliferated. Stripped of their associations with military or even government roots, they have come to be seen as economic and cultural forces, and even, in the writings of Kevin Kelly and the *Wired* group, at least, as forces of nature. And it is here that the counter-culture’s contribution to the rise of postindustrial society begins to come into view. When Stewart Brand and his generation left home to attend college, they found themselves in the heart of a research world still devoted to fending off America’s enemies. As Brand’s diary entries of the time suggest, students in this era feared that the institutions devoted to winning the cold war might end their own lives in one of two ways: first, they might fight a nuclear war and destroy the world; and second, they might offer college-educated youth no choice but to enter what they imagined to be the psychologically deadening silos of bureaucratic careers. For Brand and others, these two threats were inextricably entangled. The Free Speech marchers who invaded Sproul Hall in 1964, for instance, imagined the university as both a factory and a giant computer. Like other engines of the militarized state, they suggested, the university was devoted to creating both knowledge and

intellectual laborers with which to defend the nation. In the process, they argued, it would also annihilate the students themselves by turning them into bits of information. This critique of the military-industrial-academic complex as a mechanism, a machine, a technocratic device for the destruction of the world and for the crushing of souls, rang throughout the youth movements of the 1960s.

Nevertheless, even as they were protesting cold war research and the information technologies that supported it, students of Stewart Brand's generation were being immersed in the intellectual legacy of collaborative military research. Systems-oriented social theory, information-oriented biology and psychology, and, in cybernetics, an information-based theory that seemed to claim to link all of these domains—the waves of students entering America's universities in the late 1950s and the 1960s encountered them all. For Stewart Brand, as for the artists he met soon after graduation, and as for the New Communalist readers of the *Whole Earth Catalog* some years later, these systems theories promised a solution to the conundrums of their adolescence. On the one hand, as Norbert Wiener had argued as early as the late 1940s, cybernetics and related systems theories offered up a vision of the world in which each of its elements could be read as connected to, and to some extent a reflection of, every other. Human beings, the natural world, technological systems, institutions—all were both individual examples of and knit together within what Gregory Bateson would call “the pattern that connects.”⁸ If the atomic era had conjured up a nightmare vision of humankind broken into factions across invisible “iron curtains” and of all of humanity leveled in a single blast, cybernetics, and systems theory more generally, offered a vision of a world united, inextricably connected, and tending, at least in Norbert Wiener's view, toward the calm of homeostasis. It was this vision of a natural world engaged in constant, complex patterns of coevolution yet tending to stability that Stewart Brand first encountered among the butterflies of Stanford's Jasper Ridge. And it was this vision of the social world that the artists of USCO and the founders of communes such as Libre and the Farm invoked as they gathered to build alternative communities.

On the other hand, the technophilic orientation of cybernetics and information theory, together with the example of idiosyncratic technocrats such as Buckminster Fuller, offered the youth of the 1960s a solution to another dilemma as well. Although they had grown up under the shadow of the atomic bomb, Brand and his generation had also come of age in an era of extraordinary abundance. While the marchers of the Free Speech movement attacked the factories of American industry, those factories were bringing forth an unending stream of consumer delights for American youth. This

presented college-aged Americans with a predicament: how could they reject the core institutions of American society and yet retain access to the products of that society and the pleasures they offered?

The New Communalists parsed this dilemma by fusing the technocentrism and celebration of knowledge and experimentation common to the cold war research world with their individual quests to create alternative communities. As they turned away from the agonistic politics of the New Left, the New Communalists turned toward what they imagined to be a world interlinked by invisible systems. Much as the information systems of cybernetics could be made visible and managed by computers, the artists of USCO and the communards of the back-to-the-land movement imagined that the invisible mesh binding the social and natural worlds could be accessed through the use of small-scale technologies. If, as Stewart Brand suggested, the military-industrial complex had introduced human beings to a state in which they really did have the power to destroy the world, a state in which they really were “as gods,” then its products could also enable individual youths to become Buckminster Fuller’s Comprehensive Designers. As Fuller suggested, and as Brand and the *Whole Earth Catalog* demonstrated, they could take up the goods of industrial society and transform them into tools for their individual and collective reformation.

The New Communalists made two especially important collective decisions in the late 1960s. First, they turned away from political struggle and toward social and economic spheres as sites from which to launch social change. Second, they brought with them the central faith of the military research world: that experimentation and the proper deployment of the right technologies could save the world. In the military world, computers stood among the most prominent of these technologies. To the extent that they transformed the landmasses of the globe into information subject to monitoring, they made visible patterns of enemy behavior and so, in theory at least, could forestall a potentially devastating attack. Likewise, for the New Communalists, small-scale technologies opened up a window on the hidden patterns that linked human beings to one another and to the natural world. Some of those technologies, such as the *Whole Earth Catalog*, were explicitly informational; others, such as slide projectors and electric guitars, were more broadly communication-oriented. Still others, such as geodesic domes and LSD, did not seem to have anything “informational” about them. And yet, these various technologies had all grown out of American industry, and all were turned into tools with which to make visible the comprehensive designs of human experience. Once apparent, like the intentions of the cold war enemy, these designs could be acted upon and could allow the evolution of the human race to go forward.

Thus, the back-to-the-landers of the New Communalist movement simultaneously turned their backs on the militarized bureaucracy of the state and embraced the systems theories, the technocentric orientation, the emphasis on mind, and the collaborative, experimental sociability that had grown up within it. In the process, they reintroduced many of the core principles of research culture into American society—but this time, as the intellectual foundations of a *counterculture*. In this sense, the New Communalists did not so much represent an alternative to mainstream cold war culture as an extension of one increasingly important element of that culture. At the time, this connection between the counterculture and military research culture remained largely unspoken, if it was acknowledged at all. Gazing out from his Harvard office on waves of antiwar protest and on the New Age movement that followed, for example, Daniel Bell read the youth movements of the era as many others at the time did: as a force devoted to tearing down the bourgeois solidity of cold war American culture. The counterculture, he thundered, was “antinomian,” “anti-institutional,” and “profoundly anti-bourgeois.”⁹ In retrospect, however, the example of Stewart Brand and the Whole Earth network suggests that even as the young communards criticized midcentury bourgeois life, the antinomian, anti-institutional impulses of the New Communalist movement were working to usher in a new form of that life: the flexible, consciousness-centered work practices of the postindustrial society.

To the extent that the *Whole Earth Catalog* serves as a guide to the movement and the era, it suggests that the New Communalists helped transform from occupational into cultural categories the notions of self and community, and the ideal relationship of information and technology to both, that had already emerged within the research culture of World War II. On the communes of the back-to-the-land movement and in the pages of the *Catalog*, the mobile, entrepreneurial scientist seeking to save the world from Armageddon through his research became the Long Hunter, the Comprehensive Designer, the mobile, entrepreneurial hippie who sought to save the world through his own research at the frontiers of consciousness and community. The commune itself became a social laboratory, and daily life an experiment. Social and intellectual boundaries collapsed; each woman or man became her or his own interdisciplinarian, seeking to build a whole self and a whole world. Within this process, information and information technologies played a role much like the one assigned to them within the research world, and especially within the part of it that had helped create cybernetics. In the pages of the *Catalog*, “information” linked and facilitated the communal work of saving the planet; and the information technology of the *Catalog* itself, as a network forum, made visible the underlying structure

of the New Communalists' social world. Much as computers had allowed scientists and soldiers to monitor distant horizons, the informational tools of the *Whole Earth Catalog* turned readers into visionaries, scanning one another and the world around them for signs of Aquarian revolution.

These cultural categories outlived the protests of the era and shaped the waves of computerization to come. By the mid-1970s, the communes of the back-to-the-land movement had largely crumbled. Yet, holistic notions of self, the vision of technologies as tools for helping to create such selves, and the dream of a leveled, harmonious community linked by invisible signals remained. In the case of Stewart Brand and others associated with the *Whole Earth Catalog*, so too did a series of social networks, a set of reputations, and a series of social and rhetorical tactics for bringing communities together and facilitating the articulation of their interests. Over the next twenty years, Brand's cultural credibility and his networking skills allowed him to transform the lingering ideals of the New Communalists into ideological resources for the technologists of the computer and software industries in what had begun to be called Silicon Valley.

This process took place alongside two dramatic shifts in computer technology: miniaturization and networking. By the early 1970s, computing power that had formerly been available only to those with access to massive mainframes had been fit into desktop boxes. The machines were already "personal" in two senses: first, the technologies needed to render computers accessible to individuals, such as keyboards and television-sized monitors, had already been developed; second, thanks to time-sharing on existing mainframes, individual users had also begun to experience—and to long for more of—a feeling of complete control over their machines. The *Whole Earth Catalog*, however, offered to the computer technologists of Xerox PARC, the *People's Computer Company*, and the Homebrew Computer Club models of ways to link these existing technologies and visions of the user under the New Communalist rubric of "personal" tool use. As computer scientists such as Lee Felsenstein and Larry Tesler read the *Catalog*, they encountered a vision of technologies that could transform the individual consciousness and the world. So too did Alan Kay, first in the pages of the *Catalog* and later in the *Catalog*-derived library of Xerox PARC. As they developed their various microcomputers, some for the business world, some for hobby use, and later, in the case of Kay's work at Apple, for both, these computer scientists could imagine their work as an extension of the New Communalist social project. In his *Rolling Stone* article of 1972, Brand reinforced this impression. Xerox PARC might have emerged out of the intellectual, organizational, and technological legacy of cold war research; yet in Brand's depiction, its computer scientists, like the antiwar protestors of

Resource One, represented a cultural vanguard. They were “hackers”—versions of the Long Hunter of the *Catalog* and representatives of the experimental, exploratory ideals of the communards.

Over the next ten years, the cultural logic of New Communalism supplied key frames within which to market the new machines and granted them cultural legitimacy as well. Apple Computer, in particular, advertised its devices as tools with which to tear down bureaucracy, enhance individual consciousness, and build a new, collaborative society. The impact of the New Communalist legacy was felt well outside the boardrooms of computer and software manufacturers, though. In the 1980s Brand continued to bring together representatives of the technical world and former New Communalists, and to link computers to Whole Earth accounts of tool use. As he did, he steadily corroded the association of computers and computer technologists with the military-industrial-academic complex within which both had first appeared. By continuously depicting the desktop computer as a “personal” technology in a New Communalist sense, and by linking computer hacking to New Communalist attempts at Comprehensive Design, Brand helped build up and maintain a deep association between the ongoing migration of computers into society and New Communalism.

This association in turn helped shaped public perceptions of a second great wave of computerization: computer networking. When Brand co-founded the WELL, he helped create the socio-technical network out of which computer-mediated communication came to be publicly reimagined as virtual community and through which cyberspace was reconfigured as an electronic frontier. As bulletin board systems gave way to the public Internet and the World Wide Web, these terms became synonymous with the social effects of computer networking. In both popular and scholarly accounts of the mid-1990s, microcomputers appeared to be gateways to a new, exploratory, holistic understanding of the individual user’s self, and to new forms of intimate, harmonious community. To many, these virtual communities—and the WELL prominently among them—seemed to offer alternatives to the hierarchical bureaucracies of a heavily institutionalized material world. As wider and wider streams of digital bits flowed around the globe, filling the glassy tunnels of more and more fiber-optic cables, many imagined their movements as the reincarnation of the American frontier, a place where the world could be remade—not through the agonistic struggles of confrontational politics, but through the technology-assisted construction of exemplary ways of life.

But as a closer examination of the appearance of virtual community on the WELL reveals, the new computer networks not only created new arenas for communication, they also helped to build a social and economic

infrastructure for an increasingly common, networked form of production. For its citizens in the late 1980s, many if not most of whom worked in technology industries or journalism, the WELL offered a powerful form of economic as well as interpersonal support. Part of its power came simply from the social networks it summoned: Individuals seeking employment (at a time when job tenure for professionals in the San Francisco Bay area's technology industry averaged less than three years) could use the WELL to maintain many loose connections that could help them find work.¹⁰ Those who traded information for a living, such as journalists, could use the WELL as a data mine, gathering and distributing the facts and opinions they gathered from the WELL's many professional experts. Finally, any member could use the WELL to build a reputation, to perform or play with a new identity, and to assess the credibility of his or her online colleagues. With an emphasis on sharing, intimacy, and leveled social hierarchies inherited from the New Communalist movement, to which many WELL members had once belonged, the rhetoric of virtual community offered a powerful ideological support for the multiple, heterarchical economic relations of the WELL. To the extent that they could imagine themselves as villagers on an electronic frontier, the members of the WELL could rewrite their ongoing integration into flexible economic practices as an extension of their youthful hope to found an alternative to a stultifying bureaucratic world. They could even begin to reimagine the emerging, networked form of technocracy as the antidote they had once sought to its bureaucratic forerunner.

In the 1990s both computer networks such as the Internet and the social networks of the Whole Earth community became emblems of what many claimed at the time was a new economic and political world. Thanks in large part to the example of the Global Business Network and to the writings of Kevin Kelly and Peter Schwartz, as well as to the work of *Wired* magazine as a whole, many began to imagine that the New Communalist dream of a nonhierarchical, interpersonally intimate society was on the threshold of coming true. Despite their libertarian orientation, the writings of Esther Dyson, John Perry Barlow, and Kevin Kelly in this period fairly ache with a longing to return to an egalitarian world. For these writers and, due to their influence, for many others, the early public Internet seemed poised to model and help bring into being a world in which each individual could act in his or her own interest and at the same time produce a unified social sphere, a world in which we were "all one." That sphere would not be ruled through the work of agonistic politics, but rather by turning away from it, toward the technologically mediated empowerment of the individual and the establishment of peer-to-peer agoras. For the prophets of the Internet, as for those who had headed back to the land some thirty years earlier, it was

government, imagined as a looming, bureaucratic behemoth, that threatened to destroy the individual; in information, technology, and the marketplace lay salvation.

Cultural Entrepreneurship in the Network Mode

Between the founding of the *Whole Earth Catalog* in 1968 and the departure of Louis Rossetto, Jane Metcalfe, and Kevin Kelly from *Wired* magazine some thirty years later, then, Stewart Brand and the editors, writers, and entrepreneurs associated with the Whole Earth publications completely reversed the political valence of information and information technologies. As Brand and his generation reached the far side of middle age, the machines that had once stood for all the social forces that threatened to end their lives and perhaps even to destroy the world had become windows on a way of living and working that, according to key members of the Global Business Network and the editors of *Wired* at least, promised to fulfill their youthful dreams of an egalitarian utopia. Wedded to the aspirations of the New Communalists, computers and computer networks had become powerful ideological supports for the techno-libertarianism of the 1990s and the Internet bubble it helped spawn. Yet, they had become more than that as well. As Brand and the Whole Earth group realigned the cultural meanings of computing, they returned the technocentric, knowledge-oriented, collaborative social practices of the research world to the center of the culture at large. Stewart Brand and the back-to-the-landers of the New Communalist movement had come of age searching for an alternative to the bureaucratic mode of technocracy; some thirty years later, they had helped to substantially transform that mode, smoothing the way for the information theories and information technologies on which much of cold war technocracy depended to become ubiquitous and thoroughly integrated elements of social and economic life.

Moreover, they did so by using the social and rhetorical tactics by which the defense engineers of World War II and the cold war had organized and claimed legitimacy for their own work. Much like Norbert Wiener and the scientists of the Rad Lab, Stewart Brand had made a career of crossing disciplinary and professional boundaries. Like those who designed and funded the weapons research laboratories of World War II, Brand had built a series of network forums—some face-to-face, such as the Hacker's Conference, others digital, such as the WELL, or paper-based, such as the *Whole Earth Catalog*. Like the Rad Lab, these forums allowed members of multiple communities to meet, to exchange information, and to develop new rhetorical tools. Like their World War II predecessors, they also facilitated the

construction and dissemination of techno-social prototypes. Sometimes, as in the case of the *Catalog* or the WELL, Whole Earth productions themselves would model the sorts of relationships between technology, information, the individual, and the community favored by network members. Other times, as in the case of the terms *virtual community* and the *electronic frontier*, Whole Earth forums would be summoned to support particular rhetorical constructions.

Finally, alongside network entrepreneurship and the creation and circulation of prototypes, Brand and the Whole Earth group turned to the rhetoric of cybernetics to facilitate a complex and long-lasting exchange of legitimacy between technological and countercultural communities. In the pages of the *Catalog* and later at the Hacker's Conference, on the WELL, in the meetings of the Global Business Network, and at *Wired* magazine, the notion that social, technological, and biological systems were in fact mirrors of one another provided a rhetorical pattern within which members of one community could imagine themselves as members of—and to that extent, enjoy the legitimacy of—another. As they read the *Catalog*, communards could think of themselves not as social dropouts, but as a neoscientific avant-garde in whose social experiments lay the fate of the world. As they camped with Stewart Brand, the programmers at the first Hacker's Conference and, later, the executives attending the Global Business Network's Learning Conferences, could think of themselves not as ordinary businesspeople and manufacturers, but as a countercultural elite. In the 1960s, these sorts of legitimacy exchange had allowed for the promiscuous mingling of information theory and other systems-oriented doctrines, particularly psychedelic mysticism and disciplines derived from Buddhism and other Eastern traditions. In the 1990s, they facilitated the fusion of the economic ambitions of corporate executives with the ecological ideals and tribal cultural sensibilities of the New Communalist movement. By imagining the world as a series of overlapping information systems, and by deploying that imagination in particular organizational and media forms, Brand and his Whole Earth colleagues ultimately preserved certain New Communalist ideals long after the movement itself had faded away. They did so by creating a series of forums within which those ideals, and the social networks in which they lived, could be linked to emerging technologies and new centers of economic power.

One effect of this linkage was to sustain Brand's own authority across a series of technological, economic, and cultural eras. In the mid-1960s, Brand was an obscure itinerant photographer. Only five years later, thanks to the *Catalog*, he had become an internationally recognized spokesman for the American counterculture. By the late 1980s, thanks to the WELL, the Hacker's Conference, and his book on MIT's Media Lab, he had become an

oft-quoted source on the social potential of computing. Finally, by the mid-1990s, for the clients of the Global Business Network and the readers of *Wired*, he was both spokesman for and emblem of a networked mode of economic and social life. Although they attest to Brand's own entrepreneurial skill, these shifts also mark the power of the network mode of cultural entrepreneurship within which he worked. In Brand's case, the network mode has helped reshape public understandings of computing and create deep cultural categories with which to frame discussions of the proper relationship of the individual and the community to information technology. It has served as a way to preserve the social ideals of the New Communalist movement in the face of rapid technological and social change. And at the same time, it has helped to link new technologies, new patterns of labor, and new forms of sociability to the past, and so to offer the public familiar conceptual tools with which to confront their arrival.

For all of these reasons, the history of Stewart Brand and the Whole Earth network offers an important context in which to reconceptualize the process by which technologies take on symbolic meanings and in which to rethink the role of network entrepreneurship in the shaping of public discourse. To date, those who have studied the social work through which new technologies enter systems of representation have tended to focus on one of three ever-widening social circles: those closest to the technology itself, especially inventors and designers; those slightly farther out, including users and various related professional, technical, and legal communities; and the press.¹¹ In each case, scholars have shown how various actors have enabled a multitude of technologies to become widely used and thoroughly integrated into a society by establishing not only their material utility but also their semiotic fit with existing systems of discourse. In the case of Stewart Brand, no one of these categories adequately captures the nature of his entrepreneurial work or its effects on the cultural meaning of information technology. At various times across his career, Brand has helped design information technologies, has used them, and has reported on them for mainstream (and his own) publications. Over those same years, he has created a series of network forums within which members of all three of these circles could come together and collaboratively develop both local contact languages and, through them, key terms in which information technologies would later be understood.

Larry Tesler, a veteran of both Xerox PARC and Apple Computer, recalled encountering Brand's entrepreneurship this way: "The rest of us are just doing [something]. . . it's our life. We don't try to put it in some other context. Stewart comes along and observes it as an anthropologist would or as a journalist. He creates some new organization . . . that leverages this

through and maybe brings it to the world in a way that it wasn't before. He looks at a thing and sees a missing business or a missing publication. It's not always the same thing." The forums that Brand created brought a variety of benefits to the communities he linked. The first of these was his own cultural standing. As he became "immersed enough in a project to gain legitimacy" among its members, Tesler explained, Brand also "brought legitimacy from what he did before." Along with legitimacy, Brand brought a welter of loose connections, some in the technical world, some in the remnants of the counterculture, and some in the press. "A lot of researchers found ways to bridge fields," remembered Tesler, "but Stewart had the rare ability of knowing how you get the public to get wind of it, how to make it accessible, and get the media to cover it." Finally, Brand brought his own world-saving orientation to the construction of his forums, an orientation born out of the atomic-era fears that haunted his generation. Dennis Allison, a founding board member of the *People's Computer Company*, put it this way: "Stewart's a very moral guy. My every contact has been that he's trying to move people toward a better place. That's really the secret of Stewart."¹²

As Tesler and Allison suggest, Brand did not simply serve as a transmission channel between those networks. Instead, driven in part by the world-saving impulse of his youth, he collaborated with each community, absorbing and integrating its norms and practices. He then drew on those elements in order to establish and maintain the forums in which the networks themselves could meet. Like P. T. Barnum, he gathered performers from a variety of traditions into a series of multi-ring circuses. At the *Whole Earth Catalog*, as later at the Hackers Conference and on the WELL, these performers included technologists and counterculturalists, businessmen and journalists. Like Barnum, Brand not only hosted these multiple rings of activity, but also gave voice and meaning to the circus as a whole. While professional journalists such as John Markoff or Katie Hafner were transforming bits and pieces of the circuses into traditional newspaper and magazine accounts, Brand was working to create new forums in which the performers could collaborate with one another. As he coordinated those collaborations, Brand quickly learned to speak the contact languages developing around him. In this way, he and others like him, including most prominently Kevin Kelly and the writers of *Wired*, gave voice to an ongoing integration of ideas and practices that had first appeared in the New Communalist and high-technology research worlds. Having helped that synthesis to emerge in interpersonal collaboration among multiple communities, and having helped link it to new computing technologies, Brand, and later Kevin Kelly, Peter Schwartz, and others, found themselves in a unique position to "report" the synthesis as "news" to the rest of the world.

By means of their network entrepreneurship, then, Brand and his colleagues not only created new rhetorical and symbolic resources, but modeled the synthesis of counterculture and research culture in their own lives. For that reason, Brand and the Whole Earth network may offer important examples with which to think about the role of cultural entrepreneurship in public discourse, particularly in regard to journalism. Given the wide range of their activities, it is difficult to even think of Brand and his colleagues as journalists *per se*. Yet, even from a strictly professional point of view, they qualify. Over the years, they have founded and edited influential magazines, written popular books, and reported for outlets as mainstream as *Rolling Stone* and *Time*. They have done so, however, using tactics that fall well outside most analysts' descriptions of professional journalistic work or professional journalistic ethics.

Scholars of journalism, like journalists themselves, have tended to argue that those who report the news are distinct from those who make it and that, as a result, the power of journalists to shape public discourse derives primarily from their ability to represent the social world in media. In traditional accounts, journalists gather information, process it according to a series of professional, industrial routines, and distribute the finished product to a third group, the audience. Some have qualified this view, showing how journalistic norms are in fact historical constructions,¹³ or demonstrating that reporters often use events to establish their own professional legitimacy. Yet even these scholars have tended to take as their starting point a notion of journalists as professionals "sandwiched between the audience and the event being reported."¹⁴ In keeping with this view, many have suggested that journalists shape public perceptions of reality by acting as intermediaries. By choosing what to cover and how to frame what they see, it is argued, journalists constrain what the public can know—and often in ways that support the interests of those in power. These constraints in turn have ideological effects. For instance, as Todd Gitlin demonstrated in *The Whole World Is Watching*, his influential study of the effects of press coverage on the Students for a Democratic Society, coverage of SDS-led antiwar protests framed SDS activities in such a way as to minimize the importance of the organization's work. Simultaneously, simply by covering these protests, the press made youth across America aware of SDS and caused a sudden, massive swelling in SDS ranks.¹⁵

Such accounts work well to describe the activities of a highly professionalized press corps, but they leave little room for thinking about the ideological impact of Stewart Brand and his colleagues. Unlike full-time professional reporters, Brand and others associated with the Whole Earth network actively collaborated with what traditional journalism theory might

call “newsmakers” in the construction of rhetoric, symbols, and narratives. In the case of the Hackers’ Conference, for example, Brand created a forum within which hackers and former New Communalists could gather and imagine their individual projects as elements of a shared cultural mission. This work helped shape the public image of hackers in three ways: through the reporting done by professional journalists who had attended the conference; through the writings of Brand, Kelly, and others in the Whole Earth network; and through the promotion of Stewart Brand himself as a prototypical, if predigital, hacker. Out of the conference grew a statement that expressed a way of imagining information, one that would travel throughout public discourse in future years: “information wants to be free.” Never mind that moments before he uttered those words Brand had pointed out that “information wants to be expensive because it’s so valuable.”¹⁶ For the networks gathered at the conference, and later for the public at large, “information wants to be free” voiced an irresistible fusion of the cultural legitimacy of the research worlds that had brought forth computers and the countercultural communities that had tried to set the world “free.”

In this example, as throughout Brand’s career, frames emerged as elements in a collaborative social process. Whereas journalists are often thought to apply frames to events they witness and to represent those frames in media, Brand and the Whole Earth network in fact created the forums within which frames were constructed. Once developed, the frames could be and often were exported, by both professional journalists and network members. Moreover, within the process of their making and distribution, entrepreneurs such as Brand often took on multiple roles—founder, convener, reporter, publisher. Within the traditional professional norms of journalism, such multiplicity would be construed as conflict of interest. Yet for Brand, as for the citizens of the network forums he created, the simultaneous playing of multiple roles served as both a source and an amplifier of Brand’s own authority. By creating network forums and by choosing carefully which individuals and which networks to gather in them, Brand and others effectively granted themselves access to a diverse array of newsmakers. By bringing them together, Brand and his colleagues came to be seen as important members of those networks in their own right. Finally, as they spoke the languages of the forum’s guests and exemplified the social norms those guests had come to share, they ceased to be mere hosts and became instead representatives of the networks they had convened.

To the extent that these tactics first emerged in the research worlds of World War II, and to the degree that they invoke the systems-oriented, information metaphors of cybernetics, Brand’s form of networked cultural

entrepreneurship represents the migration into society at large of a cultural style that first grew up within a particular historical location. This migration marks a kind of cultural influence that remains invisible within contemporary accounts of journalism and public discourse. If professionalized journalists have ideological impact primarily by depicting events, Brand and the cultural entrepreneurs of his circle have had their impact in large part by transforming themselves into emblems of the social forces they have chronicled. In this way, they have framed the introduction of information technologies into American culture at two temporal levels, one short-term and one long-term. At the short-term level, they have helped synthesize and disseminate key terms on which the techno-utopianism and Internet bubble of the 1990s depended. At the long-term level, they have naturalized and legitimated the technologies, theories, and work patterns of the scientific research world as cultural rather than simply professional styles. Part of this work has involved shaping the representation of particular information technologies. But much more of it has involved building forums and social networks. Within the network forums of the Whole Earth publications and projects, Brand and his circle have created the key frames by which we have come to understand the social implications of digital technologies; at the same time they have produced the social infrastructure to support, legitimate, and disseminate those frames.

The Dark Side of Utopia

We have seen that between the late 1960s and the late 1990s, Brand and the Whole Earth network brokered a complex series of encounters between the traditions of the research world and those of the New Communalists. In the process, they helped shape visions of self and community, and of the proper relationship of work and technology to both, that became beacons by which others of their generation lived their lives. Those visions grew out of a deep distrust of the institutions that governed cold war politics and commerce and of rationalized social formations more broadly. In the late 1960s, many fled Haight-Ashbury for the hills of New Mexico hoping not only to found an alternative society but also to find a way to escape having their own lives shaped by the forces of society at large. Across the 1970s and 1980s, as the communes of the back-to-the-land movement crumbled and disappeared, Stewart Brand and the entrepreneurs of the Whole Earth group preserved these hopes by welding them to the computer technologies and flexible organizational practices of the rapidly emerging postindustrial economy. By the 1990s, it seemed to many as if the digital networks on

which that economy increasingly depended would in fact bring to life the New Communalist dream of breaking the bonds of institutional power and freeing individuals to pursue their own holistic lives.

Even today, discussions of digital technologies and the network economy continue to invoke New Communalist ideals. Yet the legacy of the communes offers a warning. As they embraced the cybernetic vision of the world as an information system, Stewart Brand and the readers of the *Whole Earth Catalog*, like the libertarian promoters of the Internet thirty years later, began to imagine that the fluid play of embodied distinctions that characterizes the social world could be dissolved into an account in which all were equally patterns of information. To many in a generation who feared that their bodies would be destroyed by the mechanized armies and the massive missiles of the Soviet Union, this account was enormously appealing. If all could be imagined as one, and if bodies themselves were no more than “pattern-complex function[s],” as Buckminster Fuller put it, then individuals could do away with the formal governance structures that had lately caused so much trouble and restore global harmony by relying instead on tools available to everyone—impulse, feeling, small-scale technologies, and the shared intuition of a collective consciousness.¹⁷

When they tried to live these ideals, however, the communards discovered that embracing systems of consciousness and information as sources of social structure actually amplified their exposure to the social and material pressures they had hoped to escape. When the members of communes such as Drop City freed themselves from the formal structures of government, for example, they quickly suffered from an inability to attend to their own material needs and to form common cause with their neighbors. The first of these difficulties grew directly out of the New Communalist rejection of formal politics. In the absence of formal rule structures, many communes saw questions of leadership and power become questions of charisma. As a result, many suffered from the rise of hostile factions, and some from the appearance of nearly dictatorial gurus. The turn away from formal politics also gave norms that the communards had brought with them from mainstream society an extraordinary governing force. In the absence of institutions that might regulate the relations of men and women, many fell back on old customs. Under the guise of social experimentation, for example, many rural communes in particular witnessed the comparative disenfranchisement of women and children. Like the men of the suburbs whose lives they had rejected, the men of many communes left the cooking and the cleaning and the care of the children to the women.

By the same cultural logic, individual communes routinely ignored the local communities among whom they settled. Drawing on notions of shared

consciousness and supported by documents such as the *Whole Earth Catalog*, they imagined themselves as members of a geographically dispersed elite bound together by means of invisible signals. The back-to-the-landers were in fact predominantly members of a particular social class, bound together by education and race and the ambition to change the world. Yet, by articulating their class identity in terms of consciousness and information networks, many found themselves unable to recognize their own dependence on others, particularly those of other classes. They ignored the degree to which their embodied lives depended on material support from distant parents and friends, and like residents of a segregated suburb, they effectively cut themselves off from the poor and the people of color among whom they often lived.

If the information workers of the postindustrial era buy into the notion that computers and the network economy will bring about a peer-to-peer utopia, as many still do, they run the risk of perpetuating the forms of suffering and exclusion that plagued the back-to-the-landers. For example, in her widely read 1997 memoir *Close to the Machine*, Ellen Ullman offered a cautionary depiction of the potential consequences of the New Communalist legacy. A forty-six-year-old freelance software engineer when she wrote her book, Ullman had been programming since 1971. Some years earlier, she had worked as an employee, but her company was bought out. Now, she wrote, "My clients hire me to do a job, then dispose of me when I'm done. I hire the next level of contractors then dispose of them." In keeping with the macroeconomic forces of the 1980s and 1990s, the pressures of rapid technological and economic change had driven Ullman into a network enterprise model of work. She explained that her clients expected consultants like her "to assemble a group of people to do a job, get it done, then disassemble. We're not supposed to invest in any one person or set of skills—no sense in it anyway. . . . The skill-set changes before the person possibly can, so it's always simpler just to change the person."¹⁸

Within their task-based networks, Ullman and her colleagues enjoyed a high-pressure form of emotional connection to one another, but no sooner was the project at hand completed than this now-intimate group had to disperse. These disruptions were painful—yet the distress they caused paled in comparison to Ullman's anxieties about her own obsolescence. The technologies with which she worked were constantly changing, and if she hoped to stay in business, she had to keep up. Since 1971, she wrote, "I have taught myself six higher-level programming languages, three assemblers, two data-retrieval languages, eight job-processing languages, seventeen scripting languages, ten types of macros, two object-definition languages, sixty-eight programming-library interfaces, five varieties of networks, and eight operat-

ing environments—fifteen, if you cross-multiply the distinct combinations of operating systems and networks. I don't think this makes me particularly unusual. Given the rate of change in computing, anyone who's been around for a while could probably make a list like this."¹⁹ In her youth, learning these languages was a great deal easier than it had now become. In middle age, her body was tiring. "Time tells me to stop chasing after the latest new everything," she wrote. "Biological life does not want to keep speeding up like a chip design, cycling ever faster year by year."²⁰

Ullman's predicament points up both the power and the perniciousness of New Communalist ideology for those who work within the technology-intensive precincts of the network economy. Despite its many stresses, Ullman's life seems to fulfill key elements of the New Communalist ethos. It is flexible and mobile, and it demands that she build small tribes around a shared mission and link them together with information and information technologies. To the extent that Ullman tries to change the world, she does so as Buckminster Fuller might suggest she should: by designing new technologies for the management of information and the transformation of society's resources into knowledge on which others can act. Yet, Ullman's turn toward technologies of consciousness and toward social and economic networks has hardly brought her into the community she seeks. On the contrary, like many rural settlers thirty years earlier, Ullman has found herself alone in an alien wilderness. Cut off from the civilizing effects of membership in permanent corporate and civic communities, Ullman hustles from employer to employer like a hired gunman in a real-life version of a late-night spaghetti western. Her power derives primarily from what knowledge of technological systems she can carry with her and secondarily from her networks of professional friends. Her personal links to her colleagues are tenuous and brief. She is lonely. And the situation is not likely to change anytime soon. As Ullman's example suggests, coupling one's life to the technologies of consciousness does not necessarily amplify one's intellectual or emotional abilities or help one create a more whole self. On the contrary, it may require individuals to deny their own bodies, the rhythms of the life cycle, and, to the extent that their jobs require them to collaborate with far-away colleagues, even the rhythms of day and night.²¹ It may in fact result in every bit as thorough an integration of the individual into the economic machine as the one threatened by the military-industrial-academic bureaucracy forty years earlier.

Furthermore, it may cut individual workers off from participating in local communities that might otherwise mitigate these effects. To stay employed, Ullman and workers like her must move from node to node within the network of sites where computers and software are manufactured and

used, and in order to pick up leads for new work, they must stay in touch with one another. As a result, programmers and others often find themselves living in a social and physical landscape populated principally by people like themselves. To succeed within that landscape, they must often turn their attention away from another, parallel landscape: the landscape of local, material things, of town boards and PTA meetings, of embodied participation in civic life. They must declare and maintain an allegiance to their own professional network, to its sites and technologies. And they must carry with them a handful of rules that Ullman trumpets with more than a little sarcasm: “Just live by your wits and expect everyone else to do the same. Carry no dead wood. Live free or die. Yeah, surely, you can only rely on yourself.”²²

For those like Ullman who have the education, the professional skills, and the lack of geographically binding social ties that allow a person to remain mobile and flexible, such libertarian nostrums can transform a series of personal losses—of time with family and neighbors, of connection to one’s body and one’s community—into a soothing narrative with which they can rationalize the limits of their own choices. As Richard Barbrook and Andy Cameron have argued, the antinomian and antistatist impulses of the American counterculture do in fact allow workers like Ullman to acknowledge the power of market forces in their lives and, paradoxically, to preserve a sense of their own autonomy.²³ However, to the degree that the libertarian rhetoric of self-reliance embraces a New Communalist vision of a consciousness-centered, information-oriented elite, it can also permit a deep denial of the moral and material costs of the long-term shift toward network modes of production and ubiquitous computing.

For Stewart Brand and, later, for the writers and editors of *Wired*, the mirror logic of cybernetics provided substantial support for this denial. For Norbert Wiener and those who followed his lead, the world consisted of a series of informational patterns, and each of those patterns in turn was also in some sense an emblem of every other. As taken up by the New Communalists, this vision produced two contradictory claims, one egalitarian and the other elitist. On the one hand, the fact that material phenomena could be imagined as part of a single, invisible whole suggested that an egalitarian order might obtain in the world. Human beings, nature, machines—all were one and each should coevolve with every other. On the other hand, though, in keeping with the vision’s history as a universal rhetorical tool with which cold war researchers claimed authority for their projects, the fact that the social and the natural, the individual and the institutional, the human and the machine could all be seen as reflections of one another suggested that those who could most successfully depict themselves as aligned

with the forces of information could also claim to be models of those forces. They could in fact claim to have a “natural” right to power, even as they disguised their leadership with a rhetoric of systems, communities, and information flow.

It was this claim that Stewart Brand and his colleagues modeled for their clients at the Global Business Network, and it is was this claim that the writers of *Wired* bolstered by depicting subjects such as Esther Dyson and George Gilder as people who spoke or acted like computers. As the communards of the back-to-the-land movement had once argued that they were forerunners of a new, more egalitarian society on the basis of their being in touch with a shared consciousness, the information consultants of the 1990s asserted that the Internet modeled not only an egalitarian future, but their own, existing lives. In touch with the flow of information, they could safely represent themselves as a “digital generation”—or, in a term much used at the time, as “digerati.”²⁴

The rhetoric of peer-to-peer informationalism, however, much like the rhetoric of consciousness out of which it grew, actively obscures the material and technical infrastructures on which both the Internet and the lives of the digital generation depend. Behind the fantasy of unimpeded information flow lies the reality of millions of plastic keyboards, silicon wafers, glass-faced monitors, and endless miles of cable. All of these technologies depend on manual laborers, first to build them and later to tear them apart. This work remains extraordinarily dangerous, first to those who handle the toxic chemicals required in manufacture and later to those who live on the land, drink the water, and breathe the air into which those chemicals eventually leak.²⁵ These tasks also continue to be the province of those who lack social and financial resources. In the mid-1980s, for instance, the Immigration and Naturalization Service estimated that 25 percent of the overall Silicon Valley workforce—approximately two hundred thousand workers—consisted of illegal aliens, many if not most of whom worked in manufacturing. In the same period, 75 percent of all Silicon Valley assemblers were women, many from the Third World. In recent years, both manufacturing and recycling have migrated overseas. And once again, women and the poor find themselves disproportionately engaged in high-risk work. Unprotected by American laws, factory hands in China and elsewhere labor eighteen hours a day at wages that often hover around thirty cents per hour building new computers. In China, India, Pakistan, and the Philippines, workers earn similar wages breaking apart computers with their bare hands to salvage the parts within.²⁶

In the 1990s, all of this work was invisible to those who promoted the Internet and the network mode of production as evidence of a new stage in

human evolution. Like the communards of the 1960s, the techno-utopians of the 1990s denied their dependence on any but themselves. At the same time, they developed a way of thinking and talking about digital technologies from within which it was almost impossible to challenge their own elite status. On the communes of the 1960s, the rhetoric of consciousness and community contained little in the way of language with which to describe, let alone confront, a less-than-egalitarian distribution of resources. The same was true of information theory and the universal rhetoric of cybernetics. In both cases, human power was an individual possession, born of the proper use of technologies for the amplification of awareness through access to information. In the writings of the *Wired* group in the 1990s, this model of power and the rhetoric on which it depended reappeared. Both persist today throughout discussions of computer-mediated communication. Even as they conjured up visions of a disembodied, peer-to-peer utopia, and even as they suggested that such a world would in fact represent a return to a more natural, more intimate state of being, writers such as Kevin Kelly, Esther Dyson, and John Perry Barlow deprived their many readers of a language with which to think about the complex ways in which embodiment shapes all of human life, about the natural and social infrastructures on which that life depends, and about the effects that digital technologies and the network mode of production might have on life and its essential infrastructures.

The End of the End of History

In that sense, for these writers, the arrival of the Internet marked not only the end of the industrial era, but the end of history itself. Forty years earlier, Stewart Brand and others of his generation had been among the first to come of age in a world that could, as a whole, be destroyed in a matter of minutes. As young adults, although they turned away from the war-making mind-set, the bureaucratic structures, and the partitioned psyches that they imagined characterized life in the military-industrial research establishment, many embraced its information theories, its collaborative, experimental orientation, and its underlying world-saving mission. Like the atomic scientists at Los Alamos, they would become Comprehensive Designers, of their own fates and, by vanguard example, of the fates of mankind. By 1968 more than a few communards believed, as Stewart Brand put it, that “We are as gods and we might as well get good at it.”

In his 1968 volume *The Young Radicals*, Kenneth Keniston looked out on the fractures within the youth movements of the day and wondered how they might ultimately shape American society. “How and whether [the] tension between alienation and activism is resolved seems to me of the greatest

importance,” he explained. In the short term, Keniston feared that antiwar activists would become frustrated at the failure to stop the conflict in Vietnam and would retreat into academe and the professions. “The field of dissent would be left to the alienated,” he wrote, “whose intense quest for *personal* salvation, meaning, creativity, and revelation dulls their perception of the public world and inhibits attempts to better the lot of others.”²⁷ In recent years, Keniston’s fears seem to have come true, particularly in discussions of the social potential of the Internet and the World Wide Web. To many, these technologies still seem to promise what the strobe lights and LSD of the Trips Festival once offered the hippies of the Haight: access to a vision of the patterns underlying the world, and by means of that vision, a way to join one’s life to them and to enter a global, harmonious community of mind. As both information technologies and the network mode of production have spread across the landscape, they have been celebrated as sites of personal and collective salvation. And to that extent, they have rendered their believers vulnerable to the material forces of the historical moment in which they live.

And yet, they have preserved a deeper dream as well. As they set off for the hills of New Mexico and Tennessee, the communards of the back-to-the-land movement hoped to build not only communities of consciousness, but real, embodied towns. Most failed—not for lack of good intentions, nor even for lack of tools, but for lack of attention to politics. To the extent that Stewart Brand and the Whole Earth group have succeeded in linking the ideals of those whom Kenneth Keniston called the alienated to digital technologies, they have allowed computer users everywhere to imagine their machines as tools of personal liberation. Over the past thirty years, this reimagining has helped transform the machines themselves, the institutions in which we use them, and society at large. Yet, as the short life of the New Communalist movement suggests, information and information technologies will never allow us to fully escape the demands of our bodies, our institutions, and the times in which we find ourselves. Much like the commune-bound readers of the *Whole Earth Catalog*, we remain confronted by the need to build egalitarian, ecologically sound communities. Only by helping us meet that fundamentally political challenge can information technology fulfill its countercultural promise.

58. Ibid., 25–26.

59. Ibid., 5, 189.

60. Ibid., 181.

61. Ibid., 385.

62. *Out of Control* was not widely reviewed at its release, but it was reviewed in several important publications and was extensively cited over the next several years. Early reviews included Poundstone, “Can You Trust Your Computer?”; Boisvert, “Weird Science”; Mitchell, “Mystifying the Net”; and Tetzeli, “Managing in a World Out of Control.”

63. Taylor, “Control in an Age of Chaos,” 65.

64. For critiques of Kelly’s cyberrevolutionism, see Terranova, “Digital Darwin”; Best and Kellner, “Kelly’s Complexity Theory”; Borsook, *Cyberselfish*.

65. As Walter Powell has pointed out, these forces included a flattening of corporate hierarchies, newly flexible employment structures for executives as well as laborers, globalization, and the integration of information technology into the firm. See Powell, “Capitalist Firm in the Twenty-First Century,” esp. 40–61.

66. Ibid., 68.

67. The Long Now Foundation is still active at this writing. Founding members included computer designer Danny Hillis, Kevin Kelly, Esther Dyson, musician Brian Eno, Peter Schwartz, and others. In 1999 Brand published a book, *The Clock of the Long Now*, about the clock project.

Chapter 7

1. Rossetto, “Why Wired?”

2. John Plunkett, who, along with his wife, Barbara Kuhr, designed the magazine, explained, “If this magazine was supposed to be bringing news from the future, it had to look like it had just arrived from the future.” Smith, “WiReD”; Rossetto, “Why Wired?”

3. Metcalfe, quoted in Gilbert, “Getting Wired.”

4. Barbrook and Cameron, “Californian Ideology.” Louis Rossetto issued a famously fiery response to Barbrook and Cameron, which can be found at <http://www.hrc.wmin.ac.uk/hrc/theory/californianideo/response/t.4.2.6.html>. For critiques of *Wired* and of cyberlibertarianism more generally, see Borsook, *Cyberselfish*; Liu, *Laws of Cool*; Mosco, *Digital Sublime*; Terranova, *Network Culture*. As Thomas Streeter has pointed out, the Californian ideology emerged out of a wider tradition of Romantic individualism, within which Stewart Brand and the *Whole Earth Catalog* played an important role. See Streeter, “That Deep Romantic Chasm.”

5. Gitlin, *Sixties*, 307.

6. Lehr and Rossetto, “New Right Credo,” 24; Rossetto, interview, January 24, 2005.

7. Wolff, *Burn Rate*, 33–34.

8. “They were some of many people zooming by [and] not particularly memorable,” Kelly recalled during an interview, July 27, 2001.

9. Keegan, “Reality Distortion Field.”

10. Kelly, interview, July 27, 2001.

11. Gordon, “Does the ‘New Economy’ Measure Up?” 50. For more on developments in personal computing technology in this period, see Ceruzzi, *History of Modern Computing* (2003), 309–12.

12. Abbate, *Inventing the Internet*, 181, 196–99. Abbate has written the definitive history of the Internet; my account of the Internet and the rise of the World Wide Web in this period follows hers.

13. *Ibid.*, 217.

14. Healtheon, for instance, saw its stock value rise 3,339 percent in this period; the price of eBay stock increased 3,269 percent. Perkins and Perkins, *Internet Bubble*, 13; Brenner, *Boom and the Bubble*, 2.

15. The relationship between information technology and productivity has been in dispute for some time. For a review and analysis of the literature on this issue in the late 1980s and early 1990s, see Brynjolfsson, “Productivity Paradox of Information Technology”; Gordon, “Does the ‘New Economy’ Measure Up?” 50, 57.

16. Shiller, *Irrational Exuberance*, 20–21, quoted in Thrift, “Romance Not the Finance Makes Business Worth Pursuing,” 426; Alan Greenspan, “The American Economy in a World Context,” at the 35th Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, May 6, 1999, available at <http://www.federalreserve.gov/board-docs/speeches/1999/19990506.htm>, quoted in Gordon, “Does the ‘New Economy’ Measure Up?” 49.

17. Frank, *One Market Under God*, xiv, 356.

18. Rossetto quoted in Keegan, “Reality Distortion Field”; Battelle quoted in Smith, “WiReD.”

19. Kelly, interview, July 27, 2001.

20. Smith, “WiReD.”

21. Rossetto, interview, January 24, 2005; Rossetto, Metcalfe, et al., *Wired* business plan.

22. “Reader Report,” internal document, *Wired*, January 1996, no pagination (in Louis Rossetto’s personal collection).

23. Quittner, “Merry Pranksters Go to Washington,” 79, 80, 81.

24. *Ibid.*, 131.

25. *Ibid.*, 80–81.

26. *Ibid.*, 80, 81 (original emphasis).

27. Two years later, *Wired* ran a much shorter story on the Electronic Frontier Foundation, entitled “How Good People Helped Make a Bad Law” and written by Rogier van Bakel. The story detailed the EFF’s role in passing a digital telephony bill that included a wiretapping provision, the foundation’s financial and management troubles, and the return of its headquarters from Washington, D. C., to San Francisco. In this story, Barlow and other staffers appeared naive. As the story’s extended headline put it, Washington had “reverse-engineered the EFF, driving it into dissension, debt, disgrace—and right out of town” (133). Yet, even as it detailed the personal failings of Barlow and others, the story left the larger metaphors of the earlier piece intact. Washington still needed reverse engineering—after all, it was entrenched bureaucrats who had driven the EFF away. The digital revolution was still under way—though the suits in Washington were trying to hold it back. And, like the countercultural revolution before it, the digital revolution would have to be headquartered in San Francisco.

28. Garreau, “Conspiracy of Heretics,” 98; Best, quoted *ibid.*, 154.

29. Michael McClure and Ramón Sender Barayón, respectively, quoted in Hafner, “Epic Saga of the WELL,” 106, 109.

30. Hafner, “Epic Saga of the WELL,” 112; Hapgood, “Media Lab at 10,” 196.

31. Hapgood, “Media Lab at 10,” 198.

32. Gilder and Dyson had known each other since the early 1980s, when Gilder had briefly covered semiconductors for Dyson's newsletter *Release 1.0*. For a thorough critical analysis of the "Magna Carta," see Moore, "Cyberspace Inc. and the Robber Baron Age."

33. Gilder, *Men and Marriage*, vii; Bronson, "George Gilder," 188.

34. For an account of these conferences, see Borsook, *Cyberselfish*, 59–61, 131–33.

35. Gilder, quoted in Kelly, "George Gilder," 39, 40.

36. *Ibid.*, 40.

37. Wiener, *Human Use of Human Beings*, 96. Two years after running this piece, Kelly and *Wired* published a mild critique of Gilder's views by David Kline and Daniel Burstein, entitled "Is Government Obsolete?" Kline and Burstein took Gilder to task for supporting temporary monopolies in the telecommunications industries and for allowing the government virtually no role in shaping telecommunications markets. Yet even here, the authors celebrated the core tenets of the analogical agreement Kelly and Gilder had struck in their interview. Business, not government, was the "beating heart of all progress, the proving ground of all innovations in technology, and the creation of social wealth" (105). In Kline and Burstein's view, as in Gilder's, information systems were both a product of the "natural" system of free market capitalism and a sign of the progress that the system had made.

38. Bronson, "George Gilder," 188.

39. Borsook, "Release," 95, 97.

40. *Ibid.*, 96.

41. *Ibid.*, 124.

42. Brand, interview, July 24, 2001; Dyson, "Friend and Foe," 106.

43. Dyson et al., "Magna Carta," 295.

44. *Ibid.*, 296, 297; U.S. Office of Scientific Research and Development, *Science, the Endless Frontier*.

45. Moore, "Cyberspace, Inc. and the Robber Baron Age," 317; Dyson et al., "Magna Carta," 303.

46. Dyson et al., "Magna Carta," 404.

47. Aufderheide, *Communications Policy and the Public Interest*, 4, 32, 37, 54, 78–81, 106–7.

48. Quarles quoted in Hipschman, "Who Speaks for Cyberspace?" For more coverage of the "Cyberspace and the American Dream II" conference, see Sayre, "Cyberspace and Newtonian Dreams"; and Kline, "'Friction-Free' Foolishness."

49. Brand's personal reaction to the libertarianism of the mid-1990s is hard to assess. When I spoke with him in 2001, he explained that he didn't "have a lot of patience for libertarianism these years." As he put it, "I don't like what Gingrich did to the country." Yet Brand had long shared Gingrich's rejection of interventionist government. "That whole victim mind-set—saying to government you're supposed to fix my problem—is total anathema to the Whole Earth," as Brand put it. Moreover, for many years Brand had celebrated business, technology, and the individual entrepreneur as key agents of social change, as had Gingrich. When asked about this connection and his rejection of Gingrich-style libertarianism in 2001, Brand replied, "I didn't make me a liberal. The Republicans made me a liberal." Interview, July 24, 2001.

50. Gingrich et al., *Contract with America*; Dyson, "Friend and Foe," 111.

51. Dyson, "Friend and Foe," 160.

52. *Ibid.*, 107.

53. This is not to say Newt Gingrich saw himself in a countercultural light. On the contrary, in 1994 he told a gathering of Republicans, “There are profound things that went wrong starting with the Great Society and the counterculture and until we address them head-on we’re going to have problems.” *New York Times*, November 10, 1994, A1, quoted in Bromell, *Tomorrow Never Knows*, 7.

54. Schwartz and Leyden, “Long Boom,” 118.

55. *Ibid.*, 116.

56. *Ibid.*, 168, 170.

57. *Ibid.*, 171.

58. Kelly, *New Rules for the New Economy*, 6.

59. *Ibid.*, 160. To get a feel for Internet-related work at the height of the dot-com bubble, see Bronson, *Nudist on the Late Shift*; and Ross, *No-Collar*. For a fascinating account of the social and psychological strategies dot-com workers used to manage the multiple risks of their employment, see Neff, “Organizing Uncertainty.”

60. Byron, “Wired Ventures Is Worth Only \$6 Million to \$10 Million.”

61. Throughout this expansion, *Wired* magazine remained the single most powerful source of income for the business. But according to some analysts, it too was losing money. In 1996, for instance, analysts estimated that *Wired* earned approximately \$17 million in advertising revenues and approximately \$10.4 million in circulation, for a gross income of \$27.4 million. Gross total expenses, however, totaled \$39.9 million. Its costs included \$17.2 million in production and distribution, \$15 million in sales and marketing, and \$7.7 million for general and administration. All in all, *Wired* magazine alone lost something like \$11.5 million in 1996 alone. *Ibid.*

62. For a detailed account of the offering process, see Wolf, *Wired*, 189–238; Byron, “Wired Ventures.”

63. Wolff, *Burn Rate*, 47; Byron, “Wired Ventures.”

Chapter 8

1. In this sense, these organizations resembled Max Weber’s classic description of bureaucracies. See Weber, Gerth, and Mills, *From Max Weber*, 196–244. For an interpretation of the resemblances and their relationship to emerging forms of enterprise, see Paul DiMaggio, introduction to DiMaggio, *Twenty-First-Century Firm*, 10.

2. For accounts of this process at the macro-social level, see Harvey, *Condition of Postmodernity*; and Castells, *Rise of the Network Society*. For accounts of the ways that this process has affected employment and the structure of the firm, several edited collections are especially helpful, among them DiMaggio, *Twenty-First Century Firm*; and DeSanctis and Fulk, *Shaping Organization Form*. For an account of the rise of contracting and its effects on workers, see Barley and Kunda, *Gurus, Hired Guns, and Warm Bodies*.

3. Bell, *Coming of Post-Industrial Society*; Harvey, *Condition of Postmodernity*; Castells, *Rise of Network Society*. For related interpretations, see Piore and Sabel, *Second Industrial Divide*; and Lash and Urry, *End of Organized Capitalism*.

4. Castells, *Rise of Network Society*, 152–53. A number of scholars have disputed the notion that postindustrial society represents a break with the historical development of industrial capitalism. One of the earliest was James Beniger. In *Control Revolution*, Beniger traced to the late nineteenth century the increasing importance of information to economic life. James W. Cortada, in *Making of the Information Society*, has recently argued that information has been a key feature of Western and particularly American culture for

hundreds of years. For similar arguments on the knowledge worker, see Chandler and Cortada, *Nation Transformed by Information*. Scholars of a Marxist orientation have been particularly aggressive in challenging the notion that the postindustrial, postmodern, or network society models actually represent a new era in capitalism. For critiques in this vein, see Slack and Fejes, *Ideology of the Information Age*; Lyon, *Information Society*; and Garnham, “Information Society Theory as Ideology.” For a thorough, critical introduction to the information society debates, see Webster, *Theories of the Information Society*.

5. Bell, *Coming of Post-Industrial Society*, 13.

6. Bell himself acknowledged this connection. “One might well say that 1945 to 1950 were the ‘birth-years,’ symbolically, of the post-industrial society,” he wrote (*ibid.*, 346). Yet, subsequent analysts have tended to downplay or ignore the role of cold war military research in shaping the network mode of production.

7. *Ibid.*, 373. See, e.g., Lyon, *Information Society*; Zuboff, *In the Age of the Smart Machine*; Castells, *Rise of Network Society*; DeSanctis and Fulk, *Shaping Organization Form*. The impact of information technology on productivity per se remains an issue of substantial debate. See Gordon, “Does the ‘New Economy’ Measure Up?”

8. Bateson, *Mind and Nature*, 7.

9. Bell, *Coming of Post-Industrial Society*, 478, 480.

10. The classic statement of the power of loose connections to shape employment opportunities can be found in Granovetter, “The Strength of Weak Ties.”

11. Inventors and designers have often played an entrepreneurial role in this regard. Bernard Carlson, for example, following Donald MacKenzie, has suggested that “inventors invent both artifacts and frames of meanings that guide how they manufacture and market their creations.” Carlson, “Artifacts and Frames of Meaning,” 176; see also MacKenzie, “Missile Accuracy.” As Charles Bazerman has demonstrated in the case of the electric light, for instance, Thomas Edison was every bit as effective an inventor of new social and symbolic collaborations as he was of new wiring schemes. Bazerman, *Languages of Edison's Light*. Scholars focused on the social construction of technology have devoted similar attention to user communities. Wiebe Bijker, for example, in “Social Construction of Bakelite,” has argued that the ensemble of beliefs and practices surrounding an emerging technology, an ensemble that he calls a “technological frame” (168) tends to emerge out of the interaction of user and inventor communities with each other and with the technology at hand. In a variation on this view, a number of digital media scholars have argued that new technologies, as they emerge, create new forms of embodied experience, which in turn lead users to turn both the machines and the new social experiences they afford into metaphors. See, e.g., Manovich, *Language of New Media*; and Wyatt, “Talking about the Future.” Finally, many analysts have focused on the role of the press, both professional and popular, in shaping popular perceptions of new technologies. As Carolyn Marvin has shown in the case of electricity, for instance, the press can serve as both a powerful shaper of emerging technologies and a deep repository of the public’s hopes and fears for the new devices. Marvin, *When Old Technologies Were New*.

12. Tesler, interview, July 26, 2001; Allison, interview, July 26, 2004.

13. For an overview of the traditional accounts and a critical study of the field, see Schudson, *Sociology of News*. Schudson, in *Discovering the News*, identifies journalistic norms as historical constructions.

14. Zelizer, *Covering the Body*, quotation on 8.

15. Gitlin, *Whole World Is Watching*, 78–129.

16. Turner, "How Digital Technology Found Utopian Ideology."

17. Fuller, *Ideas and Integrities*, 249.

18. Ullman, *Close to the Machine*, 126, 129.

19. *Ibid.*, 100–101.

20. *Ibid.*, 105.

21. For a compelling ethnography of contract workers in the United States, see Barley and Kunda, *Gurus, Hired Guns, and Warm Bodies*. Barley and Kunda demonstrate that although workers often leave full-time corporate employment in pursuit of self-fulfillment, they frequently find themselves transforming formerly personal time into time for training and the pursuit of new work. They also find that when contract workers are on the job, they often experience themselves as liminal members of work worlds in which they used to find feelings of community. For a compelling study of the effects of digital technologies on workers overseas, and particularly in India, see Aneesh, *Virtual Migration*.

22. Ullman, *Close to the Machine*, 127.

23. Barbrook and Cameron, "Californian Ideology."

24. The term *digerati* was almost certainly coined by John Brockman, a member of the downtown New York art scene of the early 1960s and an acquaintance of the USCO troupe; he went on to become a literary agent for many scientists and technologists. In 1996 he authored brief biographies of many of his friends and clients, including Brand, Dyson, Barlow, Kelly, Rheingold, and others, in a volume entitled *Digerati* and published by the fledgling book division of *Wired* magazine.

25. See Siegel and Markoff, *High Cost of High Tech*; and Hayes, *Behind the Silicon Curtain*.

26. Hayes, *Behind the Silicon Curtain*, 23, 54; Rogers and Larsen, *Silicon Valley Fever*, 144; Schoenberger, "Where Computers Go to Die."

27. Keniston, *Young Radicals*, 394.