



from
Counterculture
to
Cyberculture

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

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Contents

Acknowledgments	vii
Introduction	1
1. The Shifting Politics of the Computational Metaphor	11
2. Stewart Brand Meets the Cybernetic Counterculture	41
3. The <i>Whole Earth Catalog</i> as Information Technology	69
4. Taking the Whole Earth Digital	103
5. Virtuality and Community on the WELL	141
6. Networking the New Economy	175
7. Wired	207
8. The Triumph of the Network Mode	237
Notes	263
Bibliography	291
Index	313

Illustrations follow page 140.

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 technopianism 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 panjandrums 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. } V

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 shaped 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, convenor, 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."¹⁴

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 operating

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 networked 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.