Marita Sturken and Douglas Thomas

Introduction

Technological Visions and the Rhetoric of the New

Technologies take on a special kind of social meaning when they are new. As they emerge in various social contexts, modern technologies become the focus of intense political, economic, cultural, and even emotional investment. A so-called new technology is the object of fascination, hyperbole, and concern. It is almost inevitably a field onto which a broad array of hopes and fears is projected and envisioned as a potential solution to, or possible problem for, the world at large. Technological development is one of the primary sites through which we can chart the desires and concerns of a given social context and the preoccupations of particular moments in history. The meanings that are attributed to new technologies are some of the most important evidence we can find of the visions, both optimistic and anxious, through which modern societies cohere. When branded *new*, emergent technologies are, as Sherry Turkle notes in this volume, a kind of Rorschach test for the collective concerns of a particular age.

It is thus the case that technologies in their emergent stages have played a dramatic role in visions of the future and beliefs in the possibility of change. The history of technological development, even in its earliest forms, such as the development of writing in Greek society, has prompted a parallel history of visions about technology, visions of new possibilities and social arrangements, and of loss and nostalgia. Emergent technologies have been the fuel for social imaginings, both of what society should be and of its potential to go farther off course from some ideal path to betterment.

The most recent example of a new technology endowed with both magical and destructive powers is, of course, the Internet. The technological bubble of the 1990s, which was fueled by technological innovation and economic speculation, produced an extraordinary array of hyperbolic proclamations about its potential impact on the world. The Internet, prognosticators stated, would solve the long-standing problems of education, make bureaucracies function better, create a global community through increased connectivity, empower the disenfranchised, and forever alter the roles of consumer and producer. This fantasy of an Internet-driven world was

presented as the new hope that promised to connect the privileged few of the world with the underprivileged many.

This idealized embrace of the Internet as a new technology was inevitably accompanied by a darker fantasy about its capacity to transform human relationships. News stories about the Internet portrayed a dangerous world in which criminals and pedophiles took advantage of trusting users, government and corporations slowly eroded privacy and freedom; the media proclaimed correlations between Internet use and higher rates of depression and social isolation. Anxiety about the relatively unregulated nature of the Internet and the increased accessibility of adult material to children in the open arena of the World Wide Web was reinforced by fears that the Internet, as Sarah Banet-Weiser notes in her essay in this volume, was creating a generational divide in which parents were being left behind, thus rendering parental control obsolete.

Visions of technology have a long history of such binary thinking. The visions of technologies as life-transforming, in both transcendent and threatening ways, have been reiterated and embraced again and again throughout history, from the development of the printing press to the computer; from the telegraph to the cell phone; from photography and cinema to television; with new technologies taking the place of more established ones in a seemingly endless cycle. There is little nuance in these characterizations, or, for that matter, much sense of the complex ways in which individuals experience new technologies and integrate them into their lives. Therefore, it remains tragically the case that while technological change continues at a rapid pace, the visions that define it remain caught within a repeating cycle of overly simplistic binary frameworks.

This is particularly the case with communications technologies that have been the object of uniquely powerful visions of social change. James Carey has argued that the power awarded to technology in American culture can be defined in terms of the "transmission view" of communication, a power rooted in religious attitudes. Transmission, Carey argues, has been defined historically in terms of the transportation of ideas and knowledge, a mission that originally carried the "moral meaning" of carrying and distributing a Christian message.[1] The religious tenor of technological visions is thus derived from a kind of messianic investment in the potential of communications media to transform human nature. Carey and John Quirk refer to these optimistic characterizations as evidence of a "rhetoric of the electronic sublime," one that echoes the religious overtones of the embrace of electricity in the nineteenth century, what Leo Marx termed the "elec-

trical sublime."[2] Electricity was embraced as a transformative force, one that promised freedom, democracy, and, by implication, enlightenment. The desires invested in the promise of communication technologies, imbued with this history of religious associations, have thus been particularly overdetermined, precisely because of their capacities to connect people across distances and to create new forms of mobility. Ironically, this relentless optimism in new communication technologies creates an endless cycle of disappointments, since no new technology can possibly fulfill such expectations.

Visions of new technology are highly productive—they impact how technologies are marketed, used, made sense of, and integrated into people's lives. This book is concerned with the impact of these visions of new technologies. These essays address such questions as: Why are emergent and new technologies the screens onto which our cultures project such a broad array of social concerns and desires? Why is technology the object of such unrealistic expectations? What do these visions screen out about contemporary society? How is it possible to think about technologies outside of these frameworks? The essays in this book, which are written by scholars of new media, historians of technology, journalists who report on new technologies, and proponents of digital technology, offer a cautionary approach to the analysis of technology, examining the ways that the visions and metaphors of new technologies in large part create and define the social impact of those technologies. These essays make clear that society's capacity to project concerns and desires on technology operates as a primary form of social denial; the belief that a new technology can solve existing social problems reveals a refusal to confront fully the deeper causes of those problems and the complexity of human interaction.

Visions of technology, whether overly optimistic or anxiously dystopian, consistently award new technologies the capacity to transform. For instance, the belief that communication technologies can promote human connectivity is coupled with the fear that actual human connection has been irretrievably lost. This sense of irretrievability is basic to the power awarded technology in technological visions. Technological change is popularly understood as irreversible—once a technology is used, it is imagined that its effects cannot be undone. There is no turning back, it would seem, from the first moment of "contact" with a new technology, according to these narratives. Once experienced, a technology is imagined to have changed one's way of being in the world forever and to have created immediate kinds of dependencies. Thus, fear of children's contact with computers is

not simply about the potential acts those children can participate in with a computer, but the capacity of that computer to transform them into someone else, or, in the least, to provide them with experiences, good and bad, that change them in unalterable ways. This sense of irretrievability thus awards new technologies power in what are essentially technologically determinist ways. Indeed, while technological determinism has long been debunked in academic analysis, it retains a hold in popular discussion and understanding of the impact of technology. The pervasive sense that technologies transform us in irrevocable ways means that idealistic concepts of technology are always accompanied by the anxiety that they will also promote some kind of loss—loss of connectivity, of intimacy, of desire, of *authenticity* in some way.

This sense of loss is often focused on a concern about the impact of new technologies on connectivity and community. New communities are continually made possible by the innovations of new communication technologies, yet, as these new communities form, fears surface that they will undermine existing networks of connectivity, the family and the neighborhood. Since the impact of communication technologies is so often understood as irrevocable, these concerns are magnified. Many of the essays in this book consider the radical nature of a virtual community in response to the popular depictions of the Internet as an isolating force. They grapple with the implications of virtual communities—and what their emergence reveals about concepts of community in general. Is a virtual community one with little social cost, a kind of "community lite"?[3] These essays consider what kinds of ties are created through communication technologies, at what cost, and with what limits. The most recent concern about virtual communities can be seen in fears that current forms of globalization, fueled by communication technologies, have reduced the nation to a mere shadow of its former modern state. Yet, as Carolyn Marvin reminds us in this volume, the nation-state remains firmly in place as an entity for which bodies continue to be sacrificed.

The transformative power awarded to new technologies is directly related to the idea that technologies arise not of the world in which we live but as a force that comes magically from elsewhere, a force seemingly outside of social and political influences. Thus, it is popularly imagined that technology just hurtles forward into the future, with new inventions rising up when their moment has come. Langdon Winner has referred to this as "autonomous technology," the sense that technology is a force unto itself and beyond human control. He writes,

> In some views the perception of technology-out-of-control is associated with a process of change in which the human world is progressively transformed and incorporated by an expanding scientific technology. In others the perception focuses upon the behavior of large-scale technical systems that appear to operate and grow through a process of self-generation beyond human intervention. In others still, the matter is primarily that of individuals dwarfed by the complex apparatus surrounding them, which they must employ if they are to survive.[4]

The concept of autonomous technology depicts technology as a force that transcends history, which is just out there, waiting to be discovered by technological innovators. This concept has been essential to defining the ahistorical framework in which technology has been understood. One could argue, in fact, that discussions about technology have been ahistorical throughout history. For instance, utopian visions of the Internet have a tendency to collapse the history of technology into a set of events: beginning with the "invention of fire" proclaimed by John Perry Barlow and others, moving onward to the invention of the printing press, and then skipping over a few centuries to the development of the Internet, understood almost as a predetermined inevitability. Yet, the history of the Internet is infinitely more complex and specific to its time. It emerged from a complex mix of Cold War arms race politics, a post-1960s antiestablishment computer culture, and an increased emphasis on speed and information, which had developed from the nineteenth-century telegraph and the dissemination of television in the postwar era. The ideology of the Internet is the product of a the post-1960s appropriation of resistant cultures into various scientific and technological communities, and a particular Cold War funding relationship between universities and the military; importantly, those ideologies determined not only its structure but many of its uses. As Manuel Castells has written, Internet culture is based in part on a techno-meritocratic culture, which derives its ethic from hacker culture, and a virtual communitarian culture, which finds its roots in 1960s counterculture.[5]

History matters in very important ways to a clearer understanding of technological change. As Asa Briggs notes in this volume, it is only by situating the emergence of new technologies within the history of all technologies when they were new that we can begin to understand them. The ahistorical aspect of technological visions means that many of them borrow from the history of anxieties about life in modern society, yet present these fears as if they are a new and unique threat. Concerns about the impact of the Internet on users, for instance, echo those that greeted the telegraph,

telephone, and television. When, for instance, the 1996 Communications Decency Act, an act that was in clear violation of the First Amendment, passed in the U.S. Congress because of political hysteria about pornography on the Internet, it was an echo of congressional hearings in the 1950s about television causing juvenile delinquency. Yet, presented without this historical context, these concerns are magnified within the present, prompting not only a kind of media frenzy, but specific kinds of restrictive and often misguided policy making. Many of the essays in this book situate contemporary discussions of new technology within the history of such discourses, a strategy that inevitably exposes the hyperbole of contemporary technological visions. As these essays suggest, situating discourses of technology within history diminishes in many ways the affective hold of potential stories that can be told about them—this historical framing is a fundamental strategy in examining the limitations of technology and its social impact.

The ahistorical visions of new technologies are directly related to the fact that in the popular imagination, technology is often synonymous with the future. Yet, understanding the future is a matter of prediction, a deeply imprecise activity. History instructs us that there are serious limitations to our ability to predict the effects or uses of new communication technologies, yet tremendous resources are expended on attempts to forecast the future of technology and its potential impact. Policy makers and businesspeople have always had large stakes in predicting the impact of various technologies. As the rate of technological change accelerates, informed discussion about the impact of new technologies does not take place as they are developed but when they are already in use. Whereas technologies such as the telephone and television took years to saturate their markets, new media can accomplish the same task in a matter of months. All of this places an increased premium on prediction. Yet, the landscape of the history of technology is littered with failed predictions, some disturbing, others ironic, many laughable. Often the least visionary comments are made by innovators or inventors of the technology itself (one is reminded of Bill Gates's emphatic insistence that "640K of memory ought to be enough for anyone" or IBM founder Tom Watson's prediction that "someday computers may weigh less than 2 tons").[6]

Prediction is thus an impulse and a dilemma as well as an economic strategy. Moore's Law, computer executive Gordon Moore's now famous 1965 prediction that processor speed would double every eighteen months, has turned out to be true, at least so far, but as Barlow notes, this may be because the computer industry now depends on it being so. Technologies are

often used in ways that were unintended by their makers, and are driven by consumer demand, a phenomenon that decades of market research has done very little to decipher. Yet, it is extremely difficult to see in advance the priority that a new technology will acquire within a given society. As David Nye notes in his essay, the telegraph, telephone, phonograph, and personal computer were all thought to be mere curiosities rather than the influential inventions that they became. Many of the essays in this book seek to better understand these predictions in terms of their persistence and insistence in contemporary culture—the predictions of new technologies tell us more about the desires of a particular age than the potentials of the technologies themselves.

These desires are revealed, of course, through the language that is used to talk about new technologies and the images used to represent technology in contemporary media and popular culture. This rhetoric is not simply a means to characterize new technology, rather it serves both to define new technologies and to construct them. Metaphors about computers and the Internet are constitutive; they determine how these technologies are used, how they are understood and imagined, and the impact they have on contemporary society. Similarly, representations of technologies in science fiction not only reflect contemporary concerns about technology, but fuel the visions of technological invention. In putting into play potential images of that future, as Vivian Sobchack writes in this volume, science fiction literature and film create the potentials for particular kinds of technological visions to be pursued or realized.

Yet, the dilemma remains. For how do we talk about and represent contemporary technologies except through metaphors and representations that defined technologies of the past? Transportation is a primary source of technological rhetoric, one that, as we noted earlier, carried religious import. Indeed, Briggs writes that transportation is so integrated into our language that it forms a kind of master metaphor. In his essay, Peter Lyman discusses the implications of the metaphor of the information superhighway, a metaphor that follows the long tradition of transportation as a symbol for technological developments. The railroad was the source of emerging narratives of cultural and social transformation in the nineteenth century, functioning as an icon for the entry of modern society into the world of technology. As Langdon Winner writes in his essay, flying predated the computer as a source of utopian and highly overdetermined narratives of social harmony and individual transformation. The turn-of-the-century vision of the "aerial man" who could fly anywhere in a private plane promised a new

enlightened consciousness through the experience of flight. In the 1960s, as Barlow states, transportation was central to visions of the future, which included the prediction of driving at 240 miles per hour in the year 2000. At the time, according to Barlow, moving bodies around seemed much more important than telecommunications. It remains the case, however, that metaphors such as transportation metaphors reveal in many ways the similar inequities of new technologies that replicate those of modern transportation technologies. Richard Chabrán and Romelia Salinas write in their essay that the information superhighway, like traditional highways, drives around certain neighborhoods, circumventing the barrio. Yet, what does it mean for us to really engage with this transportation metaphor? Where is it that we are driving to and what is the meaning of this traffic? Metaphors of transportation imply that new modes of transportation will provide transcendence and that they will lift people out of their worlds and their selves, and take them to new spiritual heights—they are inevitably religious in their implications. The transportation metaphor is finally about the idea that we have a destination, that we are going somewhere, that movement has meaning—that, indeed, is its attraction.

The essays in this book argue that the rhetoric defining technology, and the representations of it, are key to how it is integrated into social lives. Thus, to examine technology rhetorically is a central aspect of understanding its impact in ways that cannot be simply measured. Metaphors such as the information superhighway provide compelling, if not seductive ways to think about technology, yet they also serve to screen out other possible ways of envisioning technological meaning. These visions of technology are thus central obstacles to addressing, as Turkle writes, "our disillusionment with the myths of progress," and to understanding and implementing social change.

As engagements with the disabling aspects of technological discourse, these essays demand that we think about new ways of considering technology's social role, impact, and integration into our lives. They ask us to look beyond, in Turkle's words, the "spin" of technological discourse. This indicates in many ways that we remain stuck, as Turkle notes, in a kind of adolescent pose in relation to technology, embracing the same visions, unable to consider what they indicate about society rather than about technology itself. Contemporary debates demonstrate our childlike relationship to technology, the ways in which we continue to play out our oedipal narratives of technology in an ongoing cycle, caught, it seems, in developmental stages of the Freudian kind. Technology is consistently posed as that which

will alleviate our sense of lack and fulfill our needs. Cultural responses to new technologies are thus shaped by both a sense of lack and loss and a hopeful investment in the possibility of resolving that lack and loss in the future.

This book thus aims to intervene in contemporary discourses of new technology, in order to address precisely what that discourse is lacking—historical context, an attention to the effects of rhetoric and metaphor, a realistic assessment of how technologies integrate into contemporary societies and affect the lives of individuals, a complex sense of the practices that individuals use to make meaning with new technologies. The essays in this book engage these issues from a variety of perspectives, and can be read or grouped in a number of ways: those that address technology within a history (Winner, Nye, Sturken, Briggs, Spigel, Sconce, Banet-Weiser, Grossman); those that critique technological rhetoric (Turkle, Lyman, Barlow, Grossman, Thomas, Marvin); those that address issues of technology and community (Gross, Marvin, Hafner, Chabrán and Salinas, Gibbs et al.); and those that are concerned with prediction (Nye, Barlow, Grossman). These concerns overlap in many of these essays, and the essays employ a range of approaches to address them. In what follows, we outline each essay individually:

Sherry Turkle's essay, " 'Spinning' Technology," examines how contemporary rhetoric about the computer and the Internet forms a kind of "spin" that renders complex narratives deceptively simple. For Turkle, the computer is too often thought of as a singular entity, "The Computer" with a capital *C*, which allows it to be awarded intentionality. In addition, Turkle argues, the Internet allows us to reflect upon contemporary anxieties about human relations and the modernist project. The distinction between understanding that a technology *facilitates* particular kinds of behavior (both positive and negative), rather than *causing* it, is crucial to Turkle's argument. Thus, she writes, it makes more sense to think of the Internet as analogous to speech—it facilitates particular kinds of interaction, some banal, some toxic, some occasionally "life-transforming." The spin about technology hides many contemporary anxieties: our fears that technology is out of control, our concerns about the idea that machines have souls and that the mind is being mechanized. At the same time, it deflects the genuine confusions we feel about the lack of distinction between the real and the simulated, and what kind of "relationship" it is appropriate to have with a machine. Importantly, the spin about technology not only defines its use, but prevents other ways of thinking about technology from being explored.

Turkle's analysis reveals the level of disavowal inherent in technological spin. Likewise, in his essay, "Sow's Ears from Silk Purses," Langdon Winner traces the history of utopian proclamations of technology and what they deny. He examines a commonplace in American public discourse, the announcement of the arrival of new, visionary technologies that promise the rise of a utopian social order. For instance, in the early twentieth century, it was predicted that the airplane would create a new period of human relations, because it would foster the sense that human beings share one sky. Private places were imagined as the future means by which ordinary people would travel for work and recreation. Winner argues that this overly optimistic, and almost always incorrect, hyperbole (which brands any critical discussion as Luddism) has an effect on how any technology is actually adopted and finds its way into everyday life. Technological optimism is not simply an amusing social flaw, but rather a destructive force that prevents us from addressing crucial questions about how technologies will affect society, democracy, and the environment.

The power awarded technology to transform society can also be seen in its constant association throughout history with spiritual phenomena and the concept of presence. In his essay, "Mediums and Media," Jeffrey Scone argues that electronic technology, beginning with the telegraph, has generated a set of myths about spiritual presence, ranging from ghosts communicating via the ether to the concept of electronic presence in cyberspace. Sconce examines the relationship of the spiritualist movement of the nineteenth century to the emerging electronic technologies of the time, and its accompanying "utopian technophilia." The telegraph, in its seeming ability to separate consciousness from the body, produced a powerful set of spiritualist stories, of spirits speaking through the wires and connecting to, in particular, female mediums. Nineteenth-century concepts of telepresence and an "electronic elsewhere" have been transposed into contemporary concepts of cyberspace as transcendental and transformative. Situating this contemporary rhetoric in relation to previous urges to imagine "electronic presence," Sconce demonstrates the historical continuity of an investment in the powerful concept of presence.

In examining both the overlap and the distinction between modern and postmodern technologies, Marita Sturken argues in her essay, "Mobilities of Time and Space," that our particular moment in time is defined by a tension between modernity and postmodernity. The railroad and the telegraph, as technologies that aided in a compression of space and time in the experience of modernity, can be seen in a continuum with technologies

such as the automobile, the freeway, and the Internet that are associated with postmodernism. Thus, many of the concepts of modernity, such as the sense that time is speeded up and that space is collapsed through technology, have been reiterated in postmodernism. For instance, notions of space changed in modernity as technologies enabled people to travel longer distances faster; this is transposed into postmodern nonplaces, such as freeways, airports, and ATM machines, which have proliferated in the past few decades. Similarly, mobile privatization, in which people use devices, such as automobiles, Walkmans, and cell phones, to create private spaces that are also mobile, demonstrates a contemporary emphasis on mobility and connectivity that is continuous with the experience of modernity. Yet, Sturken argues, there are important distinctions between certain concepts of modernism and postmodernism. In particular, the concepts of the body had shifted dramatically from the modern body to the postmodern body as a malleable, digital entity, which can be morphed into new forms and genetically mapped. This has consequences for the way that contemporary science and medicine is practiced and researched.

Historical contextualization can thus change everything about how technologies are viewed. In his contribution to this volume, Asa Briggs discusses the role a historian might play in coming to better understand the ways in which people adopt, accept, and think about new technology. A historian of the British Broadcast Corporation (BBC), Briggs contrasts the history of broadcasting, itself a central shift in the development of communication technologies, with the current belief in the Internet's transformative potential. He situates the contemporary engagement with technology's impact in relation to several older technologies, in particular the railroad, whose importance in helping to usher in the modern age is often overlooked, and the telephone. In assessing the emergence of specific technologies, Briggs argues, it is essential to foreground economics (market-driven and government- and military-based) and politics. The project of history, he argues, is crucial not only to an understanding of technological change, but to the human project itself.

Among the discourses of technology that have long histories, that of mobility has been prominent. Lynn Spigel's essay analyzes the rise of a mobile culture in the 1960s through the marketing of the portable television. The portable TV was sold as a means to take television out of doors, to new places, thus envisioning the viewer within the dual frameworks of the home theater and the mobile home. Spigel demonstrates how television has always been imagined as a medium for movement, through Raymond

Williams's concepts of TV "flow" and the "mobile privatization" by which the television set linked the private family suburban home to the modern city. As Spigel makes clear, these concepts of mobility, which carry with them traditional and highly gendered concepts of public and private, are also central to discourses of the Internet and new media. Spigel critiques contemporary theories, in particular those of Jean Baudrillard, that have declared cyberculture as a kind of liberation from traditional notions of public and private. Rather, the discourse of new technologies replicates gender divisions and reinscribes the divisions of male and female, work and leisure, and public and private, as well as racial divisions along the lines of housing and access. It is precisely the utopian rhetoric of new technology, historically and in the present, Spigel argues, that prevents us from asking larger questions about social change.

The rhetoric of technology is paralleled, of course, by its depiction in contemporary popular culture. The dominant images of technology are visions of science fiction, which, as we have noted, both reflect contemporary anxieties about technology and are constitutive elements in envisioning its future. In "Science Fiction Film and the Technological Imagination," Vivian Sobchack explores how it is that we come to understand the meaning, the "essence," of technology through our experiences with science fiction film. She focuses on the importance of special effects to the affective experience of science fiction, defining several major themes in the history of science fiction films: the equation of high technology with social progress as well as with rationalism and scientific/corporate objectives rather than human emotion; the association of high technology with elitism; and an opposition between technological autonomy and human agency. Sobchack argues that the history of science fiction film has evolved through these parallel themes of effects (special) in relation to affect (feeling), as the genre has changed over time, from representing technology as a wondrous novelty, to a broader "narrative dissatisfaction with technology."

Technology has long been the source of such visions about the future, and predictions about technologies and how they will change the future form some of the primary sources of utopian visions of technology. In his essay, "Technological Prediction," David Nye traces out the history of prediction through the three categories of prediction, forecasting, and projection. Prediction, on which so much of the marketplace rides, is difficult, Nye argues, precisely because the ways that new technologies, from the radio and the gramophone to Viagra and the Internet, will be used are often unforeseen. In addition, a technology's symbolic meanings rather than functional needs

may govern its uses. For instance, electrical companies of the nineteenth century did not predict the way that electric light would play a symbolic role in American society, and so were unprepared for such consumption as electrical billboards and Christmas tree lights. Nye argues that the utopian narratives of predictions can be divided into three groupings: natural, that technologies are "natural outgrowths of society"; ameliorative, that new machines will improve everyday life; and transformative, that new technologies will reshape social reality. Dystopian narratives are hegemonic, in the belief that a powerful minority will use them to gain control over others; apocalyptic, with new technologies as "agents of doom"; and satiric, with new devices leading to the reverse of expectations. Nye argues that technological predictions are narratives about the future and our desires for the future, rather than accurate reflections of technological capabilities.

Yet, contemporary cyberdiscourse relies a great deal on prediction. For instance, John Perry Barlow, who is a primary advocate of the uniqueness of the digital age, sets out to define a rhetoric of technology in his essay, "The Future of Prediction." In doing so, he goes about the business of "predicting the present." Drawing from lessons of recent history, Barlow puts forth the thesis that it is the rhetoric of predicting the future that brings it into being, that we "create the future we believe we deserve." Barlow argues, for instance, that Gordon Moore's now famous prediction, Moore's Law, that computer processor speed would double every eighteen months, has succeeded and continues to succeed as a prediction because "the entire computer industry and a good deal of the world economy depend on it continuing to hold." Thus, he states that the future can be invented through setting into motion a vision of what it should and will be. Rather than dismissing the rhetoric of new technology as something to be dismantled, Barlow chooses to embrace it as a means of shaping its future.

Wendy Grossman takes on the Internet predictions made by Barlow and other cyberati, such as Nicholas Negroponte, in her essay, "Penguins, Predictions, and Technological Optimism." A professional "skeptic," Grossman critiques the hyperbole that claims, for instance, that the Internet is equivalent to the discovery of fire. She demonstrates how predictions about the Internet parallel predictions made in the past about other new technologies, such as the belief that the telegraph would, in similar fashion, bring world peace. Grossman reminds us that in the 1950s people thought that domestic robots were the technology of the future and that around 1950, the chairman of IBM thought there would be a world market for only a dozen computers, indeed, that the history of technology is one of failed

predictions. Yet, she also makes a compelling argument for the ways in which the Internet does offer new forms of interaction and changing allegiance in terms of citizenship and community. In making her own predictions, Grossman argues that the Internet will remain unimportant for much of the world's population, and that it will be a passive medium for most users—indeed, that its importance will ultimately seem quite limited when eventually seen in the context of a broader history—yet that the radical nature of Usenet will be able to retain public spaces on the Internet.

The rhetoric debated by figures such as Barlow and Grossman has a direct impact not only on how we define new technologies, but also on government policy, according to Peter Lyman, who takes up the issue of metaphors as political rhetoric in his essay. Lyman examines three central metaphors that have influenced political discourse and regulation of the Internet: the information superhighway, the virtual community, and the digital library. As a transportation metaphor, the concept of the information superhighway has the effect of defining the government's role as one of building infrastructure and leaving innovation to the private sector. This has meant that information is understood in terms of commodification, rather than within the framework of a public good. Lyman argues that the metaphor of the virtual community reframes Internet activity within an economy of gift exchange as a collaborative activity, enabling the idea of cooperative institutions in cyberspace rather than the "market vision of the information superhighway." Indeed, the incorporation of concepts of community and gift exchange into Internet culture has had the effect of challenging traditional concepts of the author and intellectual property rights. Lyman's final metaphor, the digital library, suggests that the library should be the model for the Internet as a public domain. Lyman argues that the public library has throughout history served to manage the boundary between markets and communities. Yet, it also reveals the tensions between information management and the libertarian values of the Internet. Lyman's discussion demonstrates the richness with which metaphors create complex associations between the past and the present, and how these metaphors reveal the lag that exists between our understanding of changing technological contexts and the rapidity with which technologies are currently developing.

The importance of metaphor is further examined in Douglas Thomas's analysis of hackers and computer viruses. He sets forth the premise that the predominance of metaphors used to characterize hackers and malicious computer programs such as "viruses" is grounded in a fundamental

fear that technology will erase both nature and the body. Hackers have been constituted in the media through a rhetoric of games, addiction, and the hunt, with a particular emphasis, as Thomas describes in the case of Kevin Mitnick, on the hacker's body as out of control. Thomas argues that these metaphors not only frame hackers within the terms of criminality and surveillance, they also encourage everyday users of computers to submit themselves to increasingly complicated systems of social control and regulation. In a similar fashion, the use of the language of biology to describe computer programs as worms and viruses awards each the qualities of agency, cunning, even life. The rhetoric of computer technology thus serves to affirm systems of social control as computer technology in turn operates as a screen onto which anxieties about the body are displaced.

The erasure of the body has of course been central to contemporary discourses of new technology. In her essay, "Peaceable Kingdoms and New Information Technologies," Carolyn Marvin situates the body as the object through which the tensions between globalization and the nation-state can be understood. She argues against the contention that the rise of the Internet will lead to a dissolving of boundaries and borders that will threaten the survival of the nation-state. Tracing the relationship of the nation-state to communication technologies, and examining the concept of the nation as an imagined community, Marvin argues that the essential element of nation-state is not borders, but bodies. Textual communities can be distinguished from bodily communities, she writes, and it is the sacrifice of bodies that ultimately promises loyalty to the nation-state. In understanding communal and national ties, Marvin writes, we must examine their effects upon the bodies of the citizenry, rather than the textual transformations of new technologies. Hence, it is only in relation to bodies, rather than texts, that the so-called revolution of global computing may begin to transform the nation as we know it.

Analyses of community have often looked not only at the concept of the nation but also at the notion of home in uncritical ways, assuming that the relationship to home is a kind of haven for all. In "Somewhere There's a Place for Us," Larry Gross examines the ways that the Internet has functioned as an outlet for lesbian and gay teenagers for whom home is often a contested and difficult place where they cannot discuss their sexuality. Gross argues against the popular image of the Internet as a corrupting influence on youth with its access to pornography and pedophiles. It is, rather, a place where sexual minorities, especially those who are geographically isolated, can build virtual communities that are difficult or impossible for

them to develop where they live. Gross traces the role that the various media have played in the formation of gay identity, as well as the ways in which mainstream culture has worked to filter or block access to gay and lesbian material. The use of the Internet to build community is always highly contested, he argues, and the focus of legal and political battles to restrict Internet content, which has had a direct effect on gay and lesbian sites. Yet, because of the First Amendment, the Internet continues to function as a lifesaving resource for many isolated gay teenagers.

Teenagers and children have long been the source of the most acute anxieties about new technologies. In her essay "Surfin' the Net," Sarah Banet-Weiser argues that children have historically been at the center of debates over sexuality and consumerism, which have found renewed currency in the context of communication technologies. Cultural notions about the innocence of children are primary factors in attempts to restrict activity on the Internet, which in turn serves to infantalize all uses of the Internet. Banet-Weiser contends that the focus on control over children using the Internet replicates earlier debates about children and television, which was blamed in the 1950s for juvenile delinquency. Primary in these concerns about children and technology is the fear that new technologies separate parents and children, that they provide sources of information for children outside of the family and thus make parental authority obsolescent. These fears, of course, help to fuel media hype and industries in filtering software. Banet-Weiser argues that it is important to reframe contemporary discussions about the Internet and children in a way that acknowledges how this technology can be empowering for children, and provide them with a sense of community not only about them but "defined and determined *by* them."

Throughout debates on community and technology, a recurring question has been "what defines a virtual community?" Katie Hafner's essay "When the Virtual Isn't Enough," reflects on the question of what constitutes a virtual rather than a "real-life" community. Hafner contrasts her well-known case study of the WELL—the now famous Bay Area-based online community that has been used by cyberati, such as Howard Rheingold,[7] as an example of the utopian potentials of virtual communities—with the small town in western Massachusetts where her father lived before he died tragically in an airplane crash. In reflecting on cases of life and death, and the experience of mourning both online and in person, Hafner is able to examine the similarities that make the online world appear real, as well as trace out the differences—differences of proximity, spontaneity, and chance—

that allow her to conclude that the online world will never be able to replicate the experience of community in a real-life, bodily context.

Concepts of community are also directly related to notions of place and geography. Richard Chabrán and Romelia Salinas's essay is a response to contemporary discourses about the Internet that characterize it as a place where identities can be left behind or reconstructed anew. Chabrán and Salinas focus on the notion of place in both global and local spaces, analyzing the ways that digital technology has reconfigured social space. They look at how technological discourses shift when considered in the context of racial and ethnic identity and suggest ways of thinking about the global economy, the information superhighway, and the digital divide in relation to the Chicano and Latino populations within the United States. Chabrán and Salinas demonstrate how the Internet has been used by Latinos as a virtual place in which identity is negotiated, a space where ethnic identity is not erased but affirmed. Through their discussion of community digital archives, online discussion groups, community labs, and artistic engagements with the Web, Chabrán and Salinas give a picture of the complex array of activities that define an emergent Latino community on the Internet. Despite ongoing issues of the digital divide and barriers to access, Latinos have been able to use virtual space as a means to build community, to locate shared spaces, and to counter the erasure of racial and ethnic identities perpetrated by technological discourses.

Contemporary discourses of technological community have relied on the concept of globalization to define the possibility of a new world community connected via communications technologies. In the book's final essay, "The Globalization of Everyday Life," by Jennifer Gibbs et al., a team of researchers at the University of Southern California's Metamorphosis Project evaluates the ways in which the Internet and globalization are affecting people's everyday lives. This project, which aims to evaluate empirically many of the assertions of discourses about globalization and technological change, draws on research in an array of diverse neighborhoods in Los Angeles. The project examines how Angelenos of diverse ethnic origins view the concept of globalization within the framework of utopian and dystopian visions. The study reveals, among other things, the complex networks of connectivity that exist in diasporic and new immigrant communities as well as the ways that people use communication technologies to support these connections. Thus, these communities use communication technologies to support existing social and familial connections across global contexts, rather than constructing new communities online or

participating in virtual communities. These researchers thus conclude that while new technologies are making the world increasingly interconnected, and movements of people are bringing diverse peoples together geographically, this has not fostered increased communication between ethnic groups. The Internet does not have a globalizing effect on every people's communication patterns, rather, its meaning is being tailored by everyday people to give it a place in their lives.

In all of these essays, a focus on the visions of technology allows us to see the ways that technology looms over understanding of social change and everyday life. It is the constant perceived presence of technology, in particular communication technologies, that gives technological discourses such tremendous power. It is our goal in this book to begin to chip away at these visions and discourses, to see through their rhetoric, and to understand how they create a particular set of visions of the world and its future. It is through such critical work that we can begin, slowly, to participate in new ways of understanding the role of new technologies in changing social contexts, in clarifying the important yet ultimately limited ways that technology affects our lives. By unpacking the "new" we can hopefully begin to understand the limitations of new technologies and the important aspects of social change that an overinvestment in new technologies serves to mask and screen out.

Notes

1. James W. Carey, *Communication as Culture: Essay on Media and Society* (Boston: Unwin Hyman, 1989), 15–17.

2. James W. Carey with John J. Quirk, "The Mythos of the Electronic Revolution," in Carey, *Communication as Culture*, 113–41.

3. David Morley, *Home Territories: Media, Mobility and Identity* (New York: Routledge, 2000), 190.

4. Langdon Winner, *Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought* (Cambridge, Mass.: MIT Press, 1977), 17.

5. See Manuel Castells, "The Culture of the Internet," in *The Internet Galaxy: Reflections of the Internet, Business, and Society* (New York: Oxford University Press, 2001), 36–63.

6. See, for example, Ray Kurzweil's *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (New York: Dimension, 2000).

7. Howard Rheingold, *The Virtual Community: Homesteading on the Electronic Frontier* (New York: HarperPerennial, 1993).