to new media by way of Foucault's theory of the author and the feminist critique. Chapter 7 examines the question of virtuality through a critical discussion of the work of Baudrillard and Derrida.

The other chapters apply the conceptual work of the earlier chapters to the interplay of cultural domains and cyberspace. Chapter 3 looks at digital commodities. Chapter 5 discusses the emergence of digital authorship. Chapter 6 speculates about national identities and global citizenship. Chapter 8 raises the issue of the fate of ethnicity and race in electronic space. Chapter 9 brings a critical stance to discussions of the democratizing effects of the Internet.

Throughout this study I have attempted to sustain a framework that keeps open the possibility that the Internet affords an opportunity for a contribution to a new politics, that it may play a significant role in diminishing the hierarchies prevalent in modern society and in clearing a path for new directions of cultural practice. It is all too obvious that existing institutions have availed themselves of new media, expanding their reach and control and increasing their powers. Yet I believe that an exclusive focus on these dangers, however well intentioned, incurs the rhetorical effect of paralysis and closes off chances of critique and new political moves. I am by no means optimistic about these chances, but such a perspective is, I think, in the finest tradition of critical theory.

CHAPTER TWO

The Being of Technologies

Terms and Confusions

The term *technology* is particularly difficult to define and to translate. In one sense there is no problem: the English *technology* is uniformly translated in French as *la technique* and in German as *die Technik* or *Technologie.* The root of the term in all three languages is the Greek *technikos,* "pertaining to art." But here the difficulties begin. *Technology,* in the *Oxford English Dictionary,* is defined as discourse about the arts, whereas *technique* is defined as simply the arts or skills used in crafting something. In French, *la technique* is closer to the English term *technique* than to *technology,* and there is a term in French *la technologie,* even though it is seldom used in translating its English homonym. What is worse, the English term *technology* refers in the first instance in common parlance not to discourse about technique, not to skill in craftsmanship, and certainly not to the arts, but rather to machinery, to the apparatus of tools. In addition, the term *machinery* is understood as a valid general category, indicating that all machines have something in common. I will argue that this usage of the term *technology* is particularly misleading in the age of "smart machines." The only modifier for *technology,* "high technology," refers to advanced assemblages of machines but does not distinguish clearly between particular types such as mechanical or electrical, or machines that generate energy versus machines that manufacture objects, or, what is decisive now, machines that work upon natural materials versus machines that work upon information

or cultural objects. The term *technology* is thus fraught with semantic difficulties, an issue that must be kept in mind in what follows.

Intellectuals in France, and in the West more generally, have two opposing responses to technology. One view sees technology as beneficial to the humanist project of diminishing toil, eliminating disease, and pacifying the earth. In this spirit Denis Diderot assiduously studied the techniques of his day, visiting centers of production and arranging for drawings to be included in *L'encyclopédie,* the great monument of the Enlightenment, depicting the most advanced methods of production. Diderot endeavored to further human progress by disseminating as widely as possible knowledge about the practical sciences, knowledge that earlier remained the secret province of guilds. Diderot (1965) defined the purpose of *L'encyclopédie* and predicted its future influence with these words: "Discoveries in the arts will no longer run the danger of being forgotten; facts will become known to the philosophers, and reflection will be able to simplify and enlighten blind practice" (159). The perfection of tools went hand in hand with human perfectibility, which Condorcet, a generation after Diderot, predicted would continue indefinitely into the future. Against these optimists have stood those finding grave dangers in technology. From Blaise Pascal's skepticism toward progress in the seventeenth century to Jacques Ellul's horror in the face of advanced industrial society, these thinkers have warned against the seductions of the machine, its potential to corrupt humanity. In general the first group are instrumentalists, understanding technology as a neutral tool that only becomes objectionable by the uses to which it is put. The second group, termed *substantialists* by Andrew Feenberg (1991), discern significant effects to any implementation of technology, whatever their moral outcomes.

What both groups share in common, however, is a comprehension of technology as machines for acting upon natural materials. From the hammer to the robot, technology remains an instrument to shape and reshape matter. By the late twentieth century a new order of machines increasingly populate human societies, machines that have their effects not upon matter but upon symbols. These information machines, or smart machines, as Shoshana Zuboff (1988) calls them, generate, transmit, and store text, images and sound. The most compelling and fecund questions about technologies concern these smart machines, of which the computer is the emblem. Earlier discussions of technology

are often misleading or inadequate when applied to information machines. The instrumentalist position fails to recognize the transformative powers of information machines, whereas the substantialist position gears its critique of technology to processes that have little play when acting upon matter is not at issue. The terms of the debate over technology must be reconceived in relation to the emergence of qualitatively new kinds of machines. The relation of information machines to society, culture, and politics must be assessed with respect to its own problematics.

The failure to distinguish between machines that act upon matter and those that act upon symbols mars the humanist critique. Ellul (1964) defines technology *(la technique)* not as machinery but as instrumental-rational practice. "In our technological society," he writes, "*technique* is the *totality of methods rationally arrived at and having absolute efficiency* (for a given stage of development) in *every* field of human activity" (xxv; italics in original). His purpose in *The Technological Society* is to gauge the effects of technology thus understood upon economics, politics, and society in general. In each case the effects he discerns are baleful. But can the same complaint be raised against information machines? On this question Ellul is silent. The issue is particularly grave because information machines upset the position from which the critique of mechanical machines was raised, the view of humans as agents or subjects distinct from and in a stance of opposition to a world of objects. Information machines put into question humanity as instrumental agent and thereby disqualify the critique of technology as "dehumanizing."

Theorists of information machines reproduce the bifurcation of the discussion of earlier technological regimes but with differences connected to the specific features of this system of techniques. One salient change characterizes the new discussion: everyone agrees that information technologies are substantive, that, to embellish the celebrated words of Marshall McLuhan, the medium *shapes and transforms* the message. Information machines transform the humans that use them. For McLuhan they alter the ratio of the senses from one of ocular priority, during the age of mechanical machines and print, to one of tactile primacy during the age of electronic machines. In France, Jean Baudrillard and Paul Virilio have most fruitfully carried forward the critique of technology in relation to the question of how the subject is reconfigured in relation to information machines. Here the focus has been not so much on the

sense ratio of McLuhan but on language, in the case of Baudrillard, and space, in the case of Virilio.

Baudrillard's early work concerned not technology but consumption. Instead of attending to the question of the forces of production, he launched a critique of Marxism by arguing for the importance, even the priority, of the domain of consumption. With the aid of semiology, Lacanian psychoanalysis, and anthropological theory, Baudrillard articulated a shift in social importance from production to consumption. In 1981 with *Simulacra and Simulation,* however, he began to explore the effects of communication technologies in terms of a basic change in the construction of reality: the media produced hyperreality, undermining the credibility of representational discourse to capture "the real." The culture of print, with its newspapers and books, gave way to the electronic cultural construction of the television screen. Here signs are constructed in a new way, one that eludes the logic of a discourse that depends on originals that it can symbolically reproduce. Electronic media construct and present a world of symbols and images that exists only on the screen. They broadcast simulacra that bear no clear relation to a prior reality. Television reproduces and expands the semiotic logic of advertising: it uncouples the signifier from the signified and the sign from the referent, opening a new space of cultural production.

Baudrillard's exploration of the hyperreal extended generally throughout advanced industrial society: from Disneyland to malls, from the deserts of California to the postmodern architecture of Beaubourg. He never restricted his analysis to a particular technology and never defined his cultural critique in relation to technology. Yet it appeared that television was the engine of the hyperreal. Before the television monitor, the individual participates in a new cultural space in which the definition of truth is altered. No longer a correspondence to reality, no longer posing the critical question ("What relation does what I see bear to what I know?"), televisual epistemology asks rather, "Does what I see hold my attention or urge me to switch channels?" The truth of television is the Nielsen rating system: being in front of the screen and tuned into a show is the only criterion for judging the validity of the show. Without a ground in a real "behind" the simulacra, truth becomes WYSIWYG, "What you see is what you get." The implications of information technology are revolutionary: liberal and Marxist positions dissolve in favor of a postmodern logic of the hyperreal.

Baudrillard's broad reception hinged on his acute portrayal of the culture of the simulacra. Infuriating to many but intriguing to most, Baudrillard's essays outlined a world in which the humanist discourse of enlightenment seemed ineffective or even irrelevant. The mere presentation of hyperreality offended and threatened liberals and Marxists alike. When he wrote in *Libération* that "the Gulf War did not take place," the Left and Right alike shook their heads in disbelief (Baudrillard 1995b). Yet Baudrillard's own relation to simulacral culture was always deeply mixed with anxiety and disgust. His writings oozed with the spleen of the very humanist culture that found him outrageous. Indeed the limits of Baudrillard's perception of emerging postmodernity are drawn by his reluctance to take seriously the technological component in the new structuration of culture. His continued adherence to the humanist scorn of *la technique* prevented a deeper exploration of an emergent mode of information. His categories of simulacra and hyperreal, disjunct from their technological imbrication, retain a relation of opposition to the true and the real, failing to go the next step to a perception of the virtual as a new combination of real and imaginary.

The revulsion toward the postmodern evident in Baudrillard's writing was even more pronounced in Virilio's. If Baudrillard addressed mainly consumer culture and the television media, Virilio focused on war and the media of cinema. More than Baudrillard, Virilio knew about and was attuned to technological innovations of the twentieth century. His early books linked warfare and cinema through their technical connections. Virilio crossed the boundaries of political analysis, architectural engineering, and cultural studies with novel and fascinating explorations of their interconnections. In his hands the study of technology spread into the arts and the domain of culture seeped back into the sciences and their applications in society. Martin Heidegger's noteworthy phrase "The essence of technology is nothing technological" achieved in Virilio's work empirical validation. In *Speed and Politics* (1977) and *War and Cinema* (1984), Virilio opened new paths to the understanding of the present by shamelessly mixing and recombining the cultural and the technological. If Heidegger achieved a philosophical critique of technology as culture, Virilio accomplished a detailed and convincing analysis of technology as culture and the culture of technology.

For Virilio speed was the key to understanding the twentieth century, and this required a mixture of technological and cultural analysis that

forever changed both terms. "Dromology," his term for a new science of speed, combined the study of the perception of the passage through space with the vehicles, the technology, by which space was transgressed. He provided stunning examples of the cross-fertilization of technocultural fields: the influence of war on cinema and the reverse, the impact of aerial photography on the cultural experience of space, and so forth. In later works, such as *La vitesse de libération* (1995), Virilio turned his attention to the virtual spaces created in computer networks and the speed associated with electronic communications. Here the darker side of technology seems to grow in importance. The simultaneity of e-mail and chat modes on the Internet completely erases spatial factors and implodes time. The vectors of space and time are drastically reconfigured in the new technologies. They allow and even promote, he warns, forms of eroticism that threaten to destroy basic social institutions. Like Baudrillard, Virilio's awareness of and fascination with technologies of information induce in him high anxiety levels and evoke "alarms" about the future of civilization. Yet Virilio's work, in a different but parallel way from Baudrillard's, pioneers a heuristic combination of technological and cultural analysis in relation to specific machinic formations.

A continuing problem in the work of both is a residual dread of the machinic that derives not from a proper cautionary sense about innovations but from humanist assumptions about the relations of machines to people. Neither is prepared to recognize a new planetary relation of humans to machines based on the emergence of new kinds of information machines as well as a continuing, rapid dissemination of both industrial and postindustrial machines. By the late twentieth century machines populate the earth in considerable numbers and variety. Two basic questions that need to be posed about technology at this point are, Synchronically, how do we understand the combinations of humans and machines? And diachronically, do we dare ask if humans are a stage in a development of which machines are the inheritors of the planet? Initiatives in these directions were begun by Pierre Lévy and Félix Guattari.

Pierre Lévy opens a new level in understanding information machines as a new kind of object and as evoking a new kind of human subject. In works such as *Collective Intelligence* (1994) and *What Is the Virtual?* (1995), Lévy focuses on such objects as the Internet and hypertext, characterizing them as a domain of complexity in which humans are transformed,

indeed transported into a new kind of community. The virtual world of the Internet connects human intelligence from around the globe, installing in principle a new structure of interaction. Here space and time, body and mind, and subject and object are all reshaped by the parameters of the communication technology. Not Baudrillard's hyperreal but Lévy's virtual begins to render intelligible the ontology of the Internet. Modern philosophy understands objects as resulting from a process in which a potential is realized or a virtual possibility becomes actual. With phenomena like a computerized hypertext or a networked real-time community or a helmet-and-glove virtual reality (VR) system, we are confronted by objects whose structure is so indefinite that they must be characterized as virtual, not actual. These objects, through their interfaces, open to the human subject in such a manner that the subject is immersed within them and reconstituted as an element of the object. In VR systems participants are part of the computer-generated world and experience themselves as such. Object and subject combine and reshape each other in new paradigms of existence, into the realm of the virtual.

These new technologies are objects like none before them also in the sense that, especially in the case of the Internet, they are thoroughly decentralized. Whereas mechanical machines are inserted into hierarchically organized social systems, obeying and enhancing this type of structure, the Internet is ruled by no one and is open to expansion or addition at anyone's whim as long as its communication protocols are followed. This contrast was anticipated theoretically by Gilles Deleuze and Félix Guattari especially in *A Thousand Plateaus* (1980), in which they distinguished between arboreal and rhizomic cultural forms. The former is stable, centered, hierarchical; the latter is nomadic, multiple, decentered—a fitting depiction of the difference between a hydroelectric plant and the Internet. In *Chaosmosis* (1992), Guattari, in a critique of Heidegger's machinic synecdoche of the hydroelectric plant in "The Question concerning Technology" (1955), elaborated this opposition into an ontology of the "heterogenesis" of machines, the most rigorous effort thus far to comprehend the being of machines outside a humanist framework. Guattari attempts an ontology of machines outside all subject-based perspectives, such as psychoanalysis. He develops a category of the assemblage to suggest combinations of machines and humans in surprising and unanticipated configurations. The question concerning technology, then, is no mere exercise about the destruction of nature by the irrespon-

sible deployment of machines or the loss of human reality into machines or even the cultural "misshaping" of the human by its descent into the instrumental, the bringing forth or challenging or enframing of the human by the technological. Instead the conservative, "sensible" question of technology is now one of the nature of the cyborg, of the new order of humachines. And the rigorous or outrageous question of technology must be the possible inheritance of the globe by a species we call "machines" but whose nature we can barely foresee.

The Question concerning Heidegger

These are profound, even overwhelming, questions, and no one has posed them more acutely and suggestively than Heidegger. At first glance a resort to Heidegger may seem inappropriate in this context, since he is known for attributing to modern technology "the spiritual decline of the earth." Yet his antipathy to technology is matched by his sensitivity to its importance, as in the following:

> At a time when the farthermost corner of the globe has been conquered by technology and opened to economic exploitation; when any incident whatever, regardless of where or when it occurs, can be communicated to the rest of the world at any desired speed; when the assassination of a king in France and a symphony concert in Tokyo can be "experienced" simultaneously; when time has ceased to be anything other than velocity, instantaneousness, and simultaneity, and time as history has vanished from the lives of all peoples; when a boxer is regarded as a nation's great man; when mass meetings attended by millions are looked on as a triumph—then, yes then, through all this turmoil a question still haunts us like a specter: What for?—Whither?—And what then? (Heidegger 1959, 31)

So Heidegger is no simple technophobe.

To the end of carrying forward and clarifying further the theoretical issues of the matter of technology a scrupulous reexamination of his position is required. I undertake such an interrogation with no interest in an overall evaluation of Heidegger's work and certainly not of his life or his lamentable political commitments.[1] I wish to hold in suspense or better to bypass the effects of "the author function," as Foucault calls it, whereby evaluations of discourse are placed in reference to a name, an author's name as the final level of consideration (1984, 101–20). I turn to Heidegger's essay "The Question concerning Technology" with the single concern of delimiting its discursive accomplishments and confu-

sions and with the hope, still flickering in its Enlightenment lamp, that this will contribute to allaying some anxiety in those who so greet the topic. I pose the following question to the text: To what extent can Heidegger's discussion be applied to information technologies? And I reply: Not very much.[2]

Heidegger's argument may be summarized, however inadequately, as follows. The question of technology is not about technology per se but about modern humanity's way of being. Technology is fundamental to modern "culture," a term I will use for Heidegger's *Dasein*. This relation of technology to culture is always important since humanity brings itself forth in part through its way of using things, its arts and crafts. The peculiar aspect about humanity is that it brings itself forth in order to be and must recognize this process as it is happening in order to have a free relation to itself. But modern technology is a way of using things and bringing humanity into appearance that conceals this process, does violence to nature ("challenges" it), and finally ends in treating humanity with the same violence that it treats nature. Heidegger calls this way of being or culture of technology "enframing." If mankind can recognize the process of enframing for what it is, joggle its consciousness to understand the grave stakes in its deployment of technology, then it may establish a different relation to itself and to technology, one that is free in the sense that it recognizes and accepts its own cultural form, its own being. Heidegger's solution is not to abandon technology in some return to nature but to offer a spiritual shift in which technology would become entirely different from what it is.

One may approach "The Question concerning Technology" from a rhetorical point of view. In this case, Heidegger tells the reader a story: there is "an extreme danger" facing humanity. His tale, he says somewhat coyly, is "almost harmless" (1977, 20), but as a result of listening to the tale we may be saved and be free. Within this charming and alarming tale there is an argument. And within this argument Heidegger reflects on his own writing and is surprised to discover that the topic, technology, is actually important, if not apocalyptic (30). In narrative form we have an American Gothic tale or horror movie with a possible happy ending. As a consequence of hearing the story one must be frightened by the imminent and horrible danger facing us all; yet thanks to Heidegger, there is a way out. The escape is not high-tech, as in James Bond movies, but is achieved through thinking, through becoming a philosopher