

Technological Visions

*The Hopes and Fears that Shape
New Technologies*

Edited by

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4 Mobilities of Time and Space *Technologies of the Modern and the Postmodern*

IN THE 1926 film *The Crowd*, directed by King Vidor, a young man, John Sims, ventures to New York City, a place he sees as the land of opportunity. There he fully becomes a citizen of modernity, his life ruled by the clock (Sims and his fellow clerks, all assigned a number and seated in rows of identical desks, watch the clock carefully and race to the door when its hands hit 5) and dictated by the space of the modern city. Vidor's New York is dominated by crowded streets, oppressively tall skyscrapers, and the relentless traffic of cars, trolleys, and trains. It is a city in which modern life is defined not only by the crowd—the sense of living always surrounded by strangers, crowding in, pushing, staring—but also by the presence of technology in all aspects of life, by the towering skyscrapers that cast shadows on the sidewalks, and by the dangers of transportation technologies. Sims's young daughter is hit and killed by a truck while running across the street, and in his despair Sims leans out over a railroad bridge and contemplates jumping down in front of a train. Technology and its perils are omnipresent in modern life; the film seems to say, making the decision between living and dying so incremental, so potentially accidental. Vidor uses a mobile cinematic style to portray the city—gliding up the sides of skyscrapers, creating complex montages of the chaos of urban streets, and painting interiors as spare, cold spaces of alienation. In the final shot, Sims and his family sit watching a film in a movie theater. As the camera pulls away from them, as if traveling backward toward the screen, they are lost in a sea of laughing faces—elements of the masses watching mass entertainment. Their individuality lost, they are absorbed into the crowd.

Vidor's film can be situated at a particular moment in the early twentieth century, after the tragic and disastrous events of World War I, when the world of modernity was portrayed increasingly by artists, writers, and filmmakers as one of alienation, anxiety, and violence, a life threatened rather than improved by technology and industrialization. This was a time during which the experience of modernity was questioned and greeted with increasing ambivalence. It followed the turn of the century, when the

There are important parallels between the turn of the century and the turn of the millennium, particularly in terms of the intensity of technological change. The period around 1900 saw the invention of the phonograph, radio, cinema, the airplane, the automobile, the telephone, and the X ray, all of which remain important today. The end of the twentieth century witnessed the development of satellite technology, digital imaging, fax, cell phones, the Internet, and the extremely rapid expansion of the World Wide Web. Whereas the world of the turn of the century was focused on the industrial and the mass media, today's world is understood in terms of the postindustrial, globalization, and media convergence. Increasingly, large numbers of people live in a world of digital technology, virtual space, and genetic codes, one defined by computer technology. Whereas the modern was mechanical, the postmodern is decidedly electronic.

Yet, the modern and the postmodern are not as incompatible or different as such descriptions might indicate. The idea of technologies facilitating connectivity, for instance, has been central to both moments in history. While the telegraph prompted proclamations about world peace and the end of human conflict in the nineteenth century, the Internet is now declared to be the first step in a new world understanding. The telephone and television were both seen as potentially jeopardizing family cohesiveness and undermining parental authority, just as the Internet is seen to render parents powerless. The ways that these narratives are perpetuated from one technology to the next makes clear, in many ways, how contemporary society remains both modern and postmodern.

It is the aim of this essay to examine this relationship between technology and definitions of the modern and the postmodern. The term *postmodernism* has been hotly contested and debated, the subject in the 1980s and 1990s of numerous treatises on its usefulness, or not, as a term.¹ Many have argued that what is termed *postmodernism* is, in fact, deeply imbricated within the modernist project and is an example of late modernism, radical modernism, or, supermodernity. It is my goal in this essay to argue that while aspects of the modern and the postmodern overlap, there are sometimes useful distinctions between the two, which can be most clearly delineated in relation to technologies and how they are experienced, used, and integrated into daily life. Examining both the distinctions and overlap between modern and postmodern technologies can, in turn, help us to understand this particular moment of history. I begin with a chart:

experience of modernity had been emphatically embraced. As the nineteenth century turned into the twentieth, there was in Euroamerican culture a sense of standing at the precipice, embracing the future, a position both exciting and terrifying. This had been the height of modernity, with its combination of optimism with anxiety, an embrace of the new coupled with a fear of losing the past. It was primarily through the experience of modern technologies that this sense of promise and fear was produced.

Today, at the turn of the millennium, much of the industrial (and postindustrial) world finds itself at a particularly important juncture. This is not, as is often argued, defined by the replacement of modernity by postmodernity. Rather, it is a time defined by the tension between the two. The worldview of most of the industrialized world remains relentlessly modern in its valuing of science, technology, growth, and progress. Yet these modern sensibilities are integrated with an increasingly postmodern sensibility—a sense of cynicism and faguet with modernity's hurtling forward into the future, a world increasingly defined by the digital, the computer, and the virtual. Life appears to be speeding up and compressing downward at the turn of the millennium, with a sense of decreasing control over the speed of daily life. Yet, this feeling of life speeding out of control is a deeply modern one, one that prevailed throughout the twentieth century. This moment in history is thus defined specifically by the tensions of living with both the heightened qualities of modernity and the shifting worldview of postmodernism.

Technologies, in particular communication technologies, have been central to definitions of both modernity and postmodernity. Indeed, the experience of modernity has been associated so powerfully with the emergence of industrial technologies that the equation of the two is often taken for granted. Can we ever think of modernity outside of a framework of technological development? The modern is the mechanical, the industrial, and its attendant belief in progress, and the modern subject a technologized subject, whose worldview, way of being, and daily life is shaped by the integration of technology into the fabric of life—the figures of *The Crowd*. The primary symbols of modernity—railroads, skyscrapers, subways, the urban cityscape—are themselves technological artifacts. Importantly, these technologies did not create the modern condition, rather they emerged from the changing set of social imperatives and relations that constituted this condition.

between the two. I thus present this chart as a point of departure for considering what qualities are shared between the modern and the postmodern, and when distinctions between the two matter, in relation to time, space, concepts of mobility, and notions about the body.

THE MODERN EXPERIENCE OF TIME

There is perhaps no concept that embodies more profoundly the experience of modernity than that of speed. It has been noted by Lewis Mumford and others that the desire for speed emerged in the nineteenth century and became "insistent" by the sixteenth century.² Time became something new in the emerging modern world of Europe in this era, and by the nineteenth century was codified in irrevocable ways. The modern world of the nineteenth century prized synchronization, standardization, efficiency, and the predictability that this produced. This new experience of time replaced a premodern time that was dictated by region, by the cycle of the earth around the sun and the seasons of the year. Modern time was a new form of mechanical time, not so much observed as measured.

The concept of time as uniform and measurable was facilitated by new modern technologies. The mechanical clock had been invented in the fourteenth century, but until the end of the nineteenth century, town clocks could vary significantly from region to region. The standardization of time in the late nineteenth century was prompted primarily by the railroad and the telegraph and furthered as well by needs of military planners. Thus, two technologies were instrumental in the marking of time into specific time zones across the globe. Historian Stephen Kern writes:

Despite all the good scientific and military arguments for world time, it was the railroad companies and not the governments that were the first to institute it. Around 1870, if a traveler from Washington to San Francisco set his watch in every town he passed through, he would set it over two hundred times. . . . The day the railroads imposed a uniform time, November 18, 1883, was called "the day of two noons," because at midday clocks had to be set back in the eastern part of each zone—one last necessary disruption to enable the railroads to end the confusion that had so complicated their functioning and cut into their profits.³

The mapping of the world into different time zones was a particularly global act of the nineteenth century. The designation of Greenwich, England, as the center of standardized time looked, in the nineteenth century, quite commonsensical. England was conceived as the center of the world.

MODERN—POSTMODERN
 national/international—global
 hierarchical social structure—network society
 mechanical—electronic
 industrial—postindustrial
 urban city—suburban sprawl, megalopolis
 geographical space replaced by social space—nonplace
 Cartesian space—virtual space
 standing in a crowd—social isolation
 surrounded by strangers—mobile privatization
 curricular of traffic in city—Internet "traffic" and packet-switching
 city strolling, the flaneur—Web surfing
 time as measurable—time as global
 time as linear—time shifting
 analog clock/watch—digital clock/watch
 railroad—rapid speed trains (TGV and Shinkansen)
 telegraph—Internet
 subway—freeway
 airplane—space shuttle
 automobile as transportation—automobile as style
 radio—Walkman
 photograph—digital image
 typewriter—computer
 typewriter keyboard—computer mouse
 television—multimedia/DVD/TiVo
 cinema—virtual reality
 telephone—cell phone
 space travel—travel inside the body through fiberoptics
 the body as a circulatory system—the body as a genetic map
 tuberculosis and antibiotics—AIDS and retroviruses
 representation—simulacrum
 autonomous subject—multiple and fragmented subjectivities
 war of guns, bombs, machines—virtual/cyberwar
 wars as conflicts between nations—terrorism

There is, of course, pleasure in charting oppositions. Indeed, mapping and charting are crucial urges of modernity. However, my intention here is to demonstrate a set of continuums rather than binary oppositions between modernity and postmodernity. As oppositions, many of these distinctions between modernity and postmodernity cannot hold. Yet, seen as a set of continuums, which then constitute different focuses in modernity and postmodernity, these binaries can help us to see the shifting terrain and tensions

in greatly reducing how long it took people to travel long distances. In its linearity, the railroad thus operates as a primary metaphor for the meanings of modernity—it moves forward, it designates time as linear, and it restructures time and space as it hurtles toward the future, toward new places, toward destinations. As Peter Lyman notes in this volume, metaphors of transportation have been used throughout history to designate new technologies, including the current metaphor of the superhighway. The railroad as an icon of modern progress set this symbolism in motion.

Speed is, of course, central to communication technology. In contemporary media, the live and the instant have taken on even greater value, and information is increasingly considered to be of less value when it is not instant. Yet speed is also an indicator of volatility and the potential for chaos.⁶ Contemporary characterizations of the turn of the millennium and the postmodern experiences often deploy speed as a central characteristic of our era. With contemporary technologies such as live television, satellite broadcast, and the Internet, instantaneity and speed have only increased in importance. Thus, any distinction between modern and postmodern concepts of speed is negligible, simply one of degree. However, on the quality of linear time moving forward, there is an important distinction. Modern time marches forward, implying that each movement and minute toward the future is an improvement, a testimony of the importance of progress. Modern literature and art began to question this linearity, and in the postmodern context, no such faith in linear progress remains. In postmodernism, time is something to be played with, to be shifted, reversed, and fast-forwarded. Thus, it could be argued that a postmodern sensibility is closer to Walter Benjamin's famous notion of hurtling toward the future, yet, at the same time, involves a questioning of the very notion of moving forward, or of progress, at all.

MODERN AND POSTMODERN SPACE

Like the railroad, the telegraph was a defining new technology of the nineteenth century. Invented in the late eighteenth century and electrified in the 1830s, it was a primary force in the increasing speed with which information traveled over distances. It was thus influential in the collapsing and reconfiguring of space that defined the modern experience. If information could travel quickly, the meaning of that information changed. In his study of the telegraph, *The Victorian Internet*, Tom Standage describes some of the early

and the international date line was designated in the middle of the Pacific Ocean, imagined by the Europeans as an empty space, a safe place to bear the inconvenience of time skipping forward a day. Yet, from the perspective of late twentieth- and early twenty-first-century global capitalism, this mapping has had profound consequences, certainly unanticipated by the nineteenth-century proponents of uniform time. The day begins in the world not in Europe but in Asia. More important, the economic day begins in Asia, giving Asian markets significant influence on the rest of the global markets. On New Year's Day, 2000, the twenty-four-hour celebration presented a global mapping of the world in twenty-four time zones, facilitated by live and global television coverage, and beginning on a small island in the Pacific. The coverage of the millennium could be seen as an explicit embrace of connectivity in terms of globalization and the emerging postindustrial global economy, but its framework came from the desire to synchronize time in the modern era.

The railroad demanded a new kind of measurable time and also embodied the forward march of time that is so central to the modern worldview. Indeed, the railroad has often been characterized as the most quintessential technological artifact of modernity. The railroad changed the landscapes that it traversed, both literally, as hills were tunneled through and gradients smoothed out for the tracks, but also in terms of how the traveler experienced it. In his classic study, *The Railway Journey*, Wolfgang Schivelbusch writes that the railroad reconfigured the landscape that was viewed from its window, conquering nature so to speak, and speeding up the experiences of looking. Schivelbusch writes that nineteenth-century travelers who had not adjusted to the mode of industrial travel were "not able to develop modes of perception appropriate to the new form of transportation," and many of them, such as Flaubert, wrote about the oppressive tedium of train travel.⁴ The speed of the train created a monotonous landscape that could not be subject to contemplation, rendering it, in effect, "a new landscape." Similarly, French philosopher Paul Virilio argues that the nineteenth and twentieth centuries defined the era of acceleration. He states, "Up until the nineteenth century, society was founded on the brake. Means of furthering speed were very scant."⁵ With the Industrial Revolution, Virilio argues, society passes from the age of brakes to the age of the accelerator, in which "power will be invested in acceleration itself."

The railroad was the dominant symbol of acceleration. It not only codified time and sped it up in the nineteenth century, it also collapsed time

uses of the telegraph to apprehend criminals, send gambling information, and relay public news.⁷ Information was defined by the telegraph as having a higher value if it was transmitted across a distance.

In this sense, the telegraph can be seen as a device that both collapsed distance and changed the meaning of the space between various points. The capacity of the telegraph to transfer information across space meant that distance was not as central an obstacle to human interaction. Standaage tells several stories of couples who pursued romance or married over the telegraph, stories that were written up in the press as "The Dangers of Wired Love" or "Making Love by Telegraph."⁸ Thus, overcoming distance was embraced as a means to greater human connection. By extension, the telegraph was often understood within utopian terms as a medium through which world peace and reconciliation would be popular—one of the first technologies, in fact, to be thought of in global terms. Speed of communication was thus defined as an improvement in comprehension and reconciliation—the belief that the faster the messages were received, the more like-minded those communicating would become.

Space that is traveled through or traversed by wires is compressed, and takes on a different form. It becomes, in the words of Schivelbusch, an "in-between space"—not a destination. He writes, "On the one hand, the railroad opened up new spaces that were not as easily accessible before; on the other, it did so by destroying space, namely the space between points. That in-between, or travel space, which it was possible to 'savor' while using the slow, work-intensive cotechnical form of transport, disappeared on the railroads. The railroad knows only points of departure and destination."⁹ As such, the railroad transformed certain areas into in-between places, places now designated with no purpose, distinct from railroad destinations. Similarly, places that the telegraph traveled through became in-between places.

This distinction between space and place is central to the modern experience. As distances were quickly traversed and spaces were transformed by the increased mobility of the modern citizen, time and space were increasingly disconnected. Anthony Giddens argues that modernity reconfigured space in two important ways: it separated time and space, and created a distinction between space and place. If place defines a locale or specific geographical location, space is a more abstract concept, referring to social space as well as conceptual space. Giddens writes,

In pre-modern societies, space and place largely coincide, since the spatial dimensions of social life are, for the most of the population, and in most respects, dominated by "presence"—by localised activities. The advent of

modernity increasingly tears space away from place by fostering relations between "absent" others, locationally distant from any given situation of face-to-face interaction. In conditions of modernity, place becomes increasingly *phantasmagoric*: that is to say, locales are thoroughly penetrated by and shaped in terms of social influences quite distant from them.¹⁰

This separation of space from place was fostered by and in turn fueled the development of the modern technologies of the telegraph, railroad, telephone, and radio.¹¹

If modernity was characterized by a separation of space and place, in postmodernity, there is an emphasis on the proliferation of nonspaces—airports, freeways, bank machines. For instance, Margaret Morse analyzes freeways, malls, and television as the "locus of an attenuated *fiction effect*, that is, a partial loss of touch with the here and now," a distraction.¹² As nonspaces, freeways, malls, and television produce a kind of dislocation, a displacement, which in turn fosters a kind of detachment. Morse situates the freeway as a new form of mobile subjectivity, yet her analysis demonstrates the similarities between the modern experience of the railroad and the contemporary freeway. The observation that "perhaps no aspect of the freeway experience is more characteristic than the sudden realization that you have no memory of the past ten minutes of your trip" is analogous to Schivelbusch's observation that nineteenth-century railway travelers could not "read" the landscapes that they traveled through.¹³

The postmodern concept of the nonplace thus bears a contiguous relationship to the modern sense of space as compressed, traveled through, removed from actual places. The experience of nonplaces, spaces of waiting and transition such as airports, is not simply one of distraction or detachment. It is also about a kind of solitary subjectivity—not of social relations so much as an emphasized singularity. Marc Augé writes, "The space of non-place creates neither singular identity nor relations; only solitude, and simultaneity."¹⁴ In addition, as many theorists have pointed out, what count as "nonplaces" for some are places of work and even homes for others.¹⁵ Hence, concepts of postmodern space have had a tendency to ignore issues of class and privilege in relationship to space.

The collapsing of space and emergence of nonplaces demonstrate in many ways overlapping concepts of space in modernity and postmodernity. However, there are some important distinctions between ways of imagining space in both, and thus has primarily to do with the concept of the virtual. The space of the modern city is crowded and compressed, yet, at the same time, the modern experience is about an embrace of the horizon,

a sense of space as potentially infinite. Whereas in feudal and agrarian societies, the horizon evoked danger, mystery, and the unknown, in the era of modern science, the horizon signifies possibility, the capacity to look farther, into the future, and, importantly, the capacity of imaging technologies, such as photography, to allow the human eye to see farther, beyond the horizon, in aerial views, and through microscopy into the human body itself.

Modern space is both crowded and infinite: it is also tangible and measurable. Yet, the postmodern emergence of nonplaces also indicates an important shift toward, if not an ease with, the experience of virtual space. While the wireless radio and telegraph were modern media that produced experiences of virtual space, and were thought of in the mystical terms of the "ether," the increased role of virtual space has been primarily fostered by computer technology, specifically the Internet and wireless technologies of computers and mobile phones. Virtual space is antithetical to what is commonly thought of as physical space. It cannot be touched; it cannot, more important, be measured. Concepts of space in modernity were shaped in many ways by concepts of Cartesian space—the idea, derived from Descartes, that space can be defined and mapped mathematically. A Cartesian grid measures three-dimensional space along three axes, each intersecting the others at ninety degrees. In its design, it is a rationalist and scientific way of conceiving space—space is defined through its mathematical measurability.

Yet virtual space defies the laws of Cartesian science. It cannot be seen or mapped. It exists in an abstract state. A bank machine uses the language of customer service, but one's experience of it bears no relation to entering a bank building. A Web site on the World Wide Web may be experienced as a place (a "site") in virtual space, complete with "rooms" and "pages," but it exists on multiple computer screens and is physically stored on a computer server. People wearing virtual reality headsets may see the space before them as a physical space, but it cannot be mapped in Cartesian terms, any more than it can be "seen" within the computer that stores it. In traditional terms, virtual space is "invisible."

I would argue that the experience of virtual space, and the related experience of simulations, constitutes a significant shift away from the modern experience into postmodernism. This is not simply because these spaces are of increasing importance in information exchange and social interaction, but also because of the increased *ease* with which they are integrated into daily life. The rapid pace with which the World Wide Web diffused into American culture and has now become an important force worldwide is

an indicator of the social and cultural shifts that enabled this embrace—the moment when the virtual was no longer a threat but rather a comfortable space for occupation.

MOBILITY AND CONNECTIVITY

The changing concepts of space and time in the modern and the postmodern are deeply connected to the experience of mobility in modernity. In the so-called premodern world, mobility was not only rarely an option for most citizens, it was also not a value. The world outside was one to be feared, imagined as the source of a potentially infinite number of terrors. Yet, beginning with the world navigations of the fifteenth century and moving into the Scientific Revolution, European culture not only began to map beyond its horizon, but also to regard travel in increasingly positive terms. This was aided by the spoils of colonization and the ideology of racial superiority that this fostered. Thus, travel outward from Europe affirmed concepts of other cultures as more childlike and primitive in comparison to European societies, and established concepts of other races as "other" to European whites.

By the era of the railroad, mobility was a primary factor of modern life. Modern subjects were supposed to be mobile—to move from small towns into the big city, to travel by train for long distances, to take trolleys and subways from their homes to their places of work. The modern city was designed to be walked or ridden through, to be seen on the move. Cities like Paris were reconfigured to allow for mobility, as Baron Haussmann razed the city to create the wide boulevards for modern transportation systems, using the railroad as his guide. Thus, Schivelbusch argues, *circulation* was a primary value of nineteenth-century life. The streets of the modern city primarily serve traffic, rather than operating as forums for neighborhood life.¹⁶ The commerce of the emerging consumer society was also based on mobility. The urban consumer walked past advertisements and went window shopping, and the modern department store was designed for shoppers to circulate past displays without a particular destination. Schivelbusch writes:

The nineteenth century's preoccupation with the conquest and mastery of space and time had found its most general expression in the concept of circulation, which was central to the scientific social notions of the epoch. . . . The century's social organisms were replicas of events in both the biological and the traffic sphere. In other words, the nineteenth

centuries, especially futurism and Cubism, was preoccupied with depicting speed and motion, and the ways that vision was mobile, ever changing.

As the circulation of the modern city changed the social dynamic of neighborhoods, new forms of social interaction were created by the mobile modern citizen. People saw each other in passing, caught glimpses of strangers on the move, and experienced a fleeting impression of other members of the "crowd" in urban streets. Baudelaire wrote a well-known poem to a passer-by, *A une passante (To a Passer-by)*, in which he catches a mere glimpse of a majestic but mourning woman, amid the deafening noise of the street. She returns his gaze and is lost in the crowd: "A flash . . . then night!—O lovely fugitive, I am suddenly reborn from your swift glance; Shall I never see you till eternity?"²⁰ Modern artists and writers thus portrayed the relentless mobility of the city as a source of isolation and separation from others.

Forms of mobility in postmodernism tend to operate much more in the realm of the virtual than in the space of the modern city. Hence, the flaneur of modernity has been transformed into the computer user who surfs the Web, who "browzes" online while actually sitting before a computer. These forms of mobility thus increasingly take place in spaces in which people are "seen" as electronic addresses and monikers, subject to various forms of technological surveillance.

Toward the latter half of the twentieth century, there emerged through a new group of technologies a different kind of mobility, one that created yet another set of social interactions and isolation. This has been famously referred to by Raymond Williams as "mobile privatization." He wrote, "at most active social levels people are increasingly living as private small-family units, or, disrupting even that, as private and deliberately self-enclosed individuals, while at the same time there is a quite unprecedented mobility of such restricted privacies."²¹ Williams was interested in the ways that television aided in the idea of the private suburban home, which was connected to the broader social sphere via the mobile television image. He saw the automobile as a form of mobile privatization, each "shell" moving "in comparable ways but for their own different private ends."

The technologies that allow people to create private spaces that are also mobile have, of course, proliferated to an even greater extent in the late twentieth and early twenty-first centuries. The Sony Walkman or Discman allows the listener to create a private space even while walking through or riding the crowded mass transportation systems of modern cities.²² Like the automobile, these technologies are designed to allow mobile persons

century saw the health and vitality of social institutions and processes as dependent on a functioning circulatory system.¹⁷

He goes on to note that whatever was seen as part of circulation was regarded as "healthy, progressive, constructive" and all that was detached from it was seen as "diseased, medieval, subversive, threatening." In this framework, mobility is not only an important value, it is essential to the life of the city and its capacity to survive. While theorists of postmodernism often define mobility in the negative terms of detachment and derelation, within the modern city it was experienced as the life blood, the city's reason for being. Yet, at the same time, circulation and mobility were also experienced as the dangers of the modern city. As Ben Singer writes, modernity "was conceived as a barrage of stimuli."¹⁸ There was a public fascination with accidents and a proliferation of stories about the dangers of modern machines in the nineteenth century. The public saw the railroad as the site of potential (if not actual) destruction, a machine of death, and, as *The Crowd* demonstrates with its tragic scene of the young girl hit by a truck, the modern city street was risky and potentially violent in its mix of humans and machines. The modern "accident" was understood in technological terms.

Transportation systems mobilized the modern citizenry, and in turn had an effect on the ways of traversing the city on foot. The quintessential modern city dweller was, in Charles Baudelaire's concept, a flaneur who strolled the city streets in a kind of detached state, an observer who walked without destination or purpose. The flaneur is a figure defined by mobility, and indicative of changing concepts of vision. Anne Friedberg writes that new forms of visual display emerged in the nineteenth century that were based on the idea of a visual experience as a form of travel.¹⁹ Dioramas, in which audiences sat before elaborate sets with changing backgrounds, each rotated every fifteen minutes, were advertised as a form of travel—through which, for example, Parisians could imagine that they had traveled to the Great Pyramids and had seen faraway places. Panoramic paintings were designed to be viewed not from one position, but by a mobile viewer. Panoramas filled a 360-degree space that viewers would then walk along to see the full view, and were designed to be only partially in view from any given viewpoint, so that the viewer would have to move in order to see all. These early visual forms, which anticipated the development of cinema as a moving picture at the turn of the century, indicate a new kind of modern vision. Indeed, modern art of the late nineteenth and early twentieth

to feel separated from their surroundings, as well as their fellow passengers. Yet, other mobile technologies such as the mobile phone are not simply about isolation from those around us, but rather about reconfiguring connectivity—allowing one to connect to others elsewhere while separating one from those in the same place. A cell phone is designed to allow one to be connected (privately) to others while mobile. It thus transforms in dramatic ways the experience of the telephone, which was traditionally rooted in place, a telephone number designating not a user, but a particular location. While mobile phones have been the source of much scorn, as symbols of the relentless time frame of work and connectivity at the expense of human relationships, it is important to recognize that they are simply devices that do not in and of themselves define particular kinds of behavior or conversation. For instance, some of the most moving stories of how people in the World Trade Center or on hijacked airplanes responded on September 11, when they knew they were doomed, come to us from cell phones.

Yet, the concept of mobility is deeply fraught with questions of access. The mobilities of people around the globe have always taken place within hierarchies of movement—such as the difference between those who move by choice versus those who move as refugees, for instance. Doreen Massey terms these distinctions a “power-geometry” in which individuals have very different relationships to their own movements and varying access to the technologies that enable movement.²³ The concept of the postmodern nomad is thus dependent on privilege and class.

How people are connected to others is related to various forms of social organization. In recent years, the concept of networks, and the social organization of networks, have gained a central place. Manuel Castells defines a network as a set of interconnected nodes, an open structure that is able to expand without limits. He writes that “as a historical trend, dominant functions and processes in the information age are increasingly organized around networks,” creating a network society, which is “characterized by the preeminence of social morphology over social action.”²⁴ Castells argues that there were three independent processes that came together at the end of the twentieth century to make the network dominant: the increased globalization of capital and the management flexibility it requires, the demands for individual freedom and open communication, and the advances in computing and telecommunication technology.²⁵ These conditions, and the shifting social concepts of connectivity, organization, and individual rights that accompanied them, allowed the Internet to take hold so quickly in the 1990s, precisely because it enabled network forms of interaction. The

valuing of mobility, which began in modernity, thus enabled a set of changes in social structure by the end of the twentieth century. A network is dependent on mobility—the mobility of capital, information, and bodies.

MODERN AND POSTMODERN BODIES

The world imagined by Castells and theorists of the virtual, in which human interaction is organized through networks and terminals, is often a world in which bodies appear strangely absent. This is a typical quality of technological discourse. Though modern fears of technology were prompted by concerns about how machines were injuring and killing human bodies, utopian concepts of modern technology rarely considered bodies in their formulations. Modern technology was often understood as an extension of the body, as a means through which the body could be strengthened, and modern machines were often conceived in the language of morphology—as having arms, legs, and the like. Yet, for the most part, in modernism, the distinction between the human body and the machine, even when it is a robot, was clear—they are separate and bounded entities. Not so in postmodernism, in which the very concept of a body’s boundaries is under question. Thus, it is in relation to the body that we can see perhaps the greatest distinction between modern and postmodern concepts of technology.

It is with the emergence of cybernetics in the post–World War II period that concepts of the body in relation to technology began to change. In the postwar period, machines and computers are increasingly seen as embodying human characteristics, such as intelligence, and the integration of bodies and machines begins to emerge as a new value. The cyborg, a cybernetic organism that is part human and part machine, was imagined by scientists Manfred Clynes and Nathan Kline in 1960 as a means of improving the human capacity to withstand the rigors of space travel, with systems regulated by feedback and homeostasis.²⁶ The cyborg has since come to operate as a primary postmodern metaphor for a contemporary relationship to technology—the ways in which many people increasingly experience technologies as integrated into their bodies, the increased sense of a lack of boundary between machine and body. In her highly influential essay, “The Cyborg Manifesto,” Donna Haraway writes that the boundaries between animal and human, organism (human and animal) and machine, and physical and nonphysical have been “thoroughly breached.” She states, “Late twentieth-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing

and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert."²⁷

The currency of the cyborg metaphor in turn has prompted the development of new kinds of mobile technologies that are less separate from the body—wearable computers, tiny headphones for cell phones and Walkmans. In the postmodern context, there is thus an ease with imagining that the body has no distinct boundaries, that technologies such as pacemakers can be embedded in bodies without changing their human status, and that the body itself is changeable, mutable, in essence a work-in-progress. While in modernity, the body was considered to be stable in some way, something one was stuck with, in postmodernism, bodies are understood to be easily transformed. One can change one's gender (through cross-dressing and surgery), one's race (through skin tone and colored lenses), one's appearance and shape (through gym workouts, plastic surgery, and liposuction), and one's genetic makeup.

Concepts of the body are irrevocably tied into concepts of identity, and here too, distinctions between modernity and postmodernity are worth considering. Concepts of identity in modernity are related to the fears of individuality that characterize the urban modern experience—living among strangers, distinguishing oneself from the crowd. Yet, modern identity is also fundamentally rooted in Enlightenment concepts of the subject as autonomous, singular, stable, and fully conscious. The postmodern subject is much more fragmented and multiple. For instance, as Sherry Turkle argues, engagements with the Internet often involve role playing and a recognition that one can construct one's identity in multiple ways.²⁸

The discourse of postmodern technology thus has a tendency to portray the body and identity as separable entities, often erasing the body and rendering it absent. A fascination with virtual reality and identity in relation to online technology has translated into a remarkable set of assertions about how the body can be left behind. The idea, for instance, that in role-playing as someone else online, people can experience life as if they are not situated within their actual bodies, has not only been a part of cyberati discourse but also a marketing tool for Internet services. In a well-known 1999 ad, for instance, MCI declared that the Internet was a place without race, gender, or infirmities. Implicit within these characterizations is the idea that one can interact with others without one's body, that one's thoughts, way of being, and emotions are somehow disconnectable from one's body.

Some of the most significant shifts in concepts of the body, however, are

the result of new medical techniques in the late twentieth century. Medical models of the body in modernity had clear distinctions between the body and foreign entities, such as bacteria and viruses. In the postwar era, and a shift toward a postmodern view, medicine increasingly began to see the body as a kind of system, with communication technologies operating increasingly as metaphors for how the body functions—the brain thought of as a communication center, sending messages to the various organs and muscles, for instance. The immune system emerged as a primary model in the 1960s with cybernetic notions of self-regulating system governed by homeostasis.

By the late twentieth century, the body was also imagined through the framework of genetic science. Interestingly, the Human Genome Project, the massive project to map the human genome, combines deeply modern notions of science with the postmodern view of the body as easily changeable as a digital file. The Genome Project is, no doubt, about the search for origins in a distinctly modern way. The belief in the capacity to retrieve and understand those origins, and to chart them, is rooted in a modern Cartesian belief in mapping as a rational means to understanding. In this model, the body is encoded genetically, with DNA as its primary code, and it is the role of science to learn to read that code. This language comes directly from digital technology, which encodes information, such as text and images, mathematically so that it can be transported and transformed. The genetic body is imagined as a kind of digital information. It is one of the primary features of digital technology that it allows information to be exchanged, transformed, and reconfigured, and these qualities are thus transferred onto the body. The postmodern digital body is defined as profoundly alterable, easily morphed—its genetic makeup changed, its "instructions" for being now rewritten by science.

These technological metaphors, through which the body is imagined, point in many ways to a kind of disavowal of the current global crises of disease and death that Western medicine has done little to stave off. The modern medical "miracles" of antibiotics and vaccines, which eradicated many diseases worldwide, have since given rise to new, more virulent and systematic diseases. For instance, AIDS, as a retrovirus, rescripts the genetic makeup of the cells its inhabits, it is no longer a foreign entity as defined by modern science.²⁹ The current global health crisis is thus a reminder that the metaphors of the easily retooled postmodern body are deeply inadequate to define actual human bodies, and a reminder as well of the extent to which bodies are fragile entities—not systems or technologies.

MODERNITY AND POSTMODERNITY AFTER SEPTEMBER 11

The events of September 11 demonstrated in striking ways the tensions both of and between modernity and postmodernity. The terrorist attacks on that day made clear in tragic ways that a nostalgia for a supposed premodern existence can still hold tremendous symbolic power. The primary targets that day, the twin towers of the World Trade Center, were quintessential symbols of modern architecture. The sleek, straight lines of the towers unashamedly replicated the bold statements of modernism, of metal reaching in both arrogance and optimism for the sky. Yet, as objects of scorn prior to their destruction, the towers also had seemed to indicate modernism's last gasps. It was almost as if, as emblems of modernism's waning influence, the towers had to overstate themselves, to be not just tall but the tallest buildings (at least for a short while) and to be not just one building but two.

Paradoxically, though they were motivated by a profound hatred of not only of the United States and the capitalist world it symbolizes but also of the symbols of modernity, the terrorists deployed the tools of modernity in their destruction. Two jet planes, emblems of the modern optimism of air travel, the liberating narrative of man conquering the skies, destroyed two modern skyscrapers as symbols of engineering prowess and the secular belief in technological progress (as two other planes were aimed at the symbols of the nation). This was not the image of postmodern virtual warfare, of cyberwar, imagined by such theorists as Paul Virilio and Jean Baudrillard. The attack was visible, hugely spectacular, not virtual; it was thick with the tools of modern warfare.

Yet, there were aspects of September 11 that now seem to be distinctly postmodern. Despite the mundane aspects of the businesses that actually existed within them, the two towers were symbols of the emerging global capitalism, and those businesses had created, in the aftermath of the 1993 WTC bombing, broad electronic networks to safeguard their records in case of a cataclysmic event (though none imagined anything on such a scale). Cell phones and other forms of electronic and mobile communications (precisely because they were attached to users, not places) were absolutely central to how much is known about that day, to the tragic final words of family members, and to the decision of passengers to take one plane down rather than let it become a weapon. And it is now known that failed communication networks were also tragically responsible for many firefighters losing their lives. Communication technologies and networks were thus central to the response of the attacks. In addition, biotechnology and genetic science

has been important to the aftermath, as DNA identification has been central to the long and painful task of identifying bodies and body parts.

The attacks on September 11 were a criminal act, carried out not by a nation declaring war, but by a network—the quintessential organizing framework of postindustrial capitalism and postmodernism. The cell organization structure of the al Qaeda network, a new kind of terrorist organization, is highly decentralized—just as difficult to take down as the Internet, since when part of each is disabled, decentralization allows the other parts to continue to function. This is a much darker aspect of the network society than the Internet, which marks the potential for new kinds of global conflict. Nevertheless, the attacks provoked the very modern response of a declaration of war.

Just as the violence of World War I forced a rethinking of the beliefs in modern technology, so this event, as other contemporary acts of violence, should demand a reconsideration of the investment in postmodern fantasies of leaving physical bodies behind and embracing the virtual. As Walter Benjamin wrote of the aftermath of World War I: "A generation that had gone to school on a horse-drawn streetcar now stood under the open sky in a countryside in which nothing remained unchanged but the clouds, and beneath those clouds, in a field of force of destructive torrents and explosions, was the tiny, fragile human body."³⁰ Like the wars that it has been used to justify, as well as other acts of violence upon the human body, September 11 reminds us that the human body remains fragile in ways that biotechnology cannot alter. The shard of a body may be identifiable through postmodern technology, but it remains testimony to the immutability, the vulnerability, and the intangible uniqueness of the human body itself.

NOTES

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1. See, for instance, Fredric Jameson, *Postmodernism, or, The Cultural Logic of Late Capitalism* (Durham, N.C.: Duke University Press, 1991); Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984); and David Harvey, *The Condition of Postmodernity* (Cambridge, Mass.: Blackwell, 1990). Anthony Giddens argues against many of the distinctions between modernity and postmodernity that are made by these theorists in *The Consequences of Modernity* (Stanford, Calif.: Stanford University Press, 1990), Chapters 4 and 5.

2. Lewis Mumford, *Tectonics and Civilization* (New York: Harcourt, Brace, 1934), Chapter 1.
3. Stephen Kern, *The Culture of Time and Space: 1880–1918* (Cambridge, Mass.: Harvard University Press, 1983), 12.
4. Wolfgang Schivelbusch, *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (Berkeley: University of California Press, [1977] 1986), 58.
5. Paul Virilio and Sylvère Lotringer, *Pure War*, trans. Mark Polizzotti (New York: Semiotext(e), 1983), 44–45.
6. Kern notes that an acceleration of time was key to the ways in which a series of events culminated, not inevitably but rapidly, into World War I. He writes that ultimatums with short time frames played an important role in the escalation toward conflict: "a great many factors led to the breakdown of peace, but the sheer rush of events was itself an independent cause that catapulted Europe into war" (*The Culture of Time and Space*, 262). Ironically, the new dependence on modern communication technologies aided in altering the tenor of diplomacy. This demonstrated a tragic belief in technology that would soon be shaken by its highly destructive deployment on the battlefield. Hundreds of telegraph messages were sent between the Russian tsar and the German kaiser in last-minute negotiations to avert war, yet, Kern argues, the telegraph ultimately only aided in the failure of diplomacy, which had had a tradition of slow exchange.
7. Tom Standage, *The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's On-line Pioneers* (New York: Berkley Books, 1998).
8. *Ibid.*, 13–39.
9. Schivelbusch, *The Railway Journey*, 37–38.
10. Giddens, *The Consequences of Modernity*, 18–19.
11. This distinction that Michel de Certeau makes in *The Practice of Everyday Life*, than the distinction that Margaret Morse, "An Ontology of Everyday Distraction: The Freeway, the Mall, and Television," in *Logics of Television: Essays in Cultural Criticism*, ed. Patricia Mellencamp (Bloomington: Indiana University Press, 1990), 193.
12. David Brodsley, L.A. *Freeway: An Appreciative Essay* (Berkeley: University of California Press, 1981), 41, discussed in Morse, "An Ontology of Everyday Distraction," 203.
13. Marc Augé, *Non-places: Introduction to an Anthropology of Supermodernity*, trans. John Howe (London: Verso, 1995), 103.
14. See, for instance, David Morley, *Home Territories: Media, Mobility, and Identity* (New York: Routledge, 2000), 176; and John Tomlinson, *Globalization and Culture* (Chicago: University of Chicago Press, 1999), 111–12.
15. Schivelbusch, *The Railway Journey*, 183.
16. *Ibid.*, 194–95.
17. Ben Singer, "Modernity, Hyperstimulus, and the Rise of Popular Sensationalism," in *Cinema and the Invention of Modern Life*, ed. Leo Charney and Vanessa R. Schwartz (Berkeley: University of California Press, 1995), 73.
18. Anne Friedberg, *Window Shopping: Cinema and the Postmodern* (Berkeley: University of California Press, 1993).
19. Walter Benjamin analyzes this poem in *Charles Baudelaire: A Lyric Poet in the Era of High Capitalism*, trans. Harry Zohn (London: NLB [Verso], 1973), 45.
20. Raymond Williams, *The Year 2000* (New York: Pantheon, 1983), 188.
21. For a discussion of the Walkman as a cultural form, see Paul du Gay, Stuart Hall, Linda Jane, Hugh Mackay, and Keith Negus, *Doung Cultural Studies: The Story of the Sony Walkman* (Thousand Oaks, Calif.: Sage, 1997).
22. See Doreen Massey, "Power-Geometry and a Progressive Sense of Place," in *Mapping the Futures*, ed. J. Bird et al. (New York: Routledge, 1993), and *Space, Place, and Gender* (Minneapolis: University of Minnesota Press, 1994).
23. Manuel Castells, *The Rise of the Network Society* (Malden, Mass.: Blackwell, 1996), 467.
24. Manuel Castells, *The Internet Galaxy: Reflections on the Internet, Business, and Society* (New York: Oxford University Press, 2001), 2.
25. Manfred Clynes and Nathan Kline, "Cyborgs in Space," in *The Cyborg Handbook*, ed. Chris Hables Gray (New York: Routledge, 1995), 29–33.
26. Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 152.
27. Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York: Simon and Schuster, 1995).
28. See Marita Sturken, *Tangled Memories: The Vietnam War, the AIDS Epidemic, and the Politics of Remembering* (Berkeley: University of California Press, 1997), chapter 7.
29. Walter Benjamin, "The Storyteller: Reflections on the Work of Nikolai Leskov," *Illuminations* (New York: Schocken Books, 1969), 84.