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Katherine Hayles, Mark Poster, and Samuel Weber, series editors

Volume 2. *High Technē: Art and Technology from the Machine Aesthetic to the Posthuman*
R. L. Rutsky

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Ken Hillis

High Technē

Art and Technology from the Machine Aesthetic to the Posthuman

R. L. Rutsky

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Introduction
The Question concerning High Tech

From the perspective of the ever more technologized cultures of the industrialized world, it seems increasingly difficult to avoid the sense that, somehow, the entire world has undergone an indefinable but undeniable change, a kind of mutation. Thus, for example, Jean Baudrillard can speak of "the mutation of [a] properly industrial society into what could be called our techno-culture."[1] This sense of a techno-cultural mutation has, of course, frequently been figured in terms of postmodernity—as part of a broader shift from modern to postmodern. But then, the very notions of both modernity and postmodernity are quite simply inconceivable without technology. This is not to say, however, that technology is the "determining instance" of either modern or postmodern culture, nor that the current sense of a techno-cultural mutation is based on particular changes in technology. Rather, whatever changes or mutations have occurred in contemporary cultures—whether one calls these cultures postmodern or not—seem to be based less on changes in technology per se than in the very conception of technology, of what technology is.

There have, of course, been innumerable discussions of technology and the interrelation of technological and cultural change in recent years. Popular magazines such as *Time* and *Newsweek* have featured cover stories on "cyberpunk" and "techno-mania," and other magazines devoted entirely to "new tech" and "high tech"—such as *Wired, Mondo 2000,* and *Boing, Boing*—have sprung into existence. Nor have university presses and academic journals ignored the issue of technological and cultural change, even if their discussions have often taken place under the somewhat broader rubric of "postmodern culture" or "techno-culture."

Yet, despite the time and energy devoted to the issue, the debates over technology and techno-culture often seem to have a wearisome sameness.

Even when the debate concerns technological change, the terms of the debate do not seem to change at all: technology—or some aspect of it—is either celebrated or decried, cast as utopian or dystopian, in terms of its capacity either to serve "humanity" or to threaten it. The repetitiveness of these arguments results from the fact that they take the *definition* of technology for granted. For all the discussion of the implications of technological change, remarkably little attention has been devoted to possible changes in the *conception* of technology.

In other words, even as views of technology have—in an age of high technology—implicitly changed, the definition of technology has remained largely unquestioned. What has been left unexamined, then, is precisely Heidegger's "question concerning technology"—which is not, for Heidegger, a question of technology per se, but rather of what he calls "the essence *[Wesen]* of technology," which "is by no means anything technological."[2] Indeed, Heidegger argues that it is just this nontechnological "essence" that has been obscured by the commonly accepted definition of technology as instrumental, as a means to an end. For Heidegger, this instrumental conception of technology—although it presumes to define "what technology is," to define "the technological"—is merely the modern manifestation of "the essence of technology." In other words, the modern conception of technology, because it restricts the definition of the technological to instrumental terms, "blinds us to" that broader "essence" that informs not only the modern view of technology, but also the quite different conceptions of traditional technology and the *technē* of ancient Greece. Thus, Heidegger seeks to reenvision not only what technology is, but what it can be. Heidegger's "broader" view of technology, therefore, seems particularly appropriate to the question of how the conception of technology may have changed in an age of high technology—appropriate, that is, to what might well be called "the question concerning high tech."

This question concerning high tech is, as Heidegger suggests, a historical question. The very notion of modernity—from its beginnings in the Renaissance's image of itself as a new age, a historical break from the "Dark Ages"—has been defined in terms of an instrumental conception of technology, an instrumental or technological rationality that allows modern "humanity" to know and control the world. In these terms, that which is "nontechnological" cannot be modern.[3] If, however, Heidegger questions the "universality" of this instrumental conception of technology by pointing to its historical specificity (as modern), he neglects the extent to which it is also culturally specific. Modernity, defined in terms of an instrumental technology and rationality, has long been the basis on which Western, patriarchal cultures have privileged themselves over their "nontechnological" others.[4] From this perspective, cultures or discourses—for example, "non-Western" cultures, "feminine" discourses—that perceive the world in terms other than those of rational, scientific knowledge and technological control are necessarily characterized as antimodern, irrational, often even as "primitive." Thus, although the sense of a cultural, technological mutation may itself be specific to "highly technologized" cultures, its implications are not; for, if in high technology the modern conception of technology has changed, so too has the relation of "technoculture" to those supposedly nontechnological "other" cultures and discourses that modernity has always devalued, excluded, or repressed.

High Technē

"High technology" would seem, at first glance, to be simply a matter of *more* technology—that is, a more extreme, more effective version of modern technology. And certainly, the instrumental or functional conception that defines modern technology remains an important aspect of high technology, or "high tech." No one could deny the uncanny "functionality" of those military and "Star Wars" technologies that have allowed war and killing to be instrumentalized to an unprecedented degree. Nor is it possible to disregard the efficiency with which various information technologies enable an increasing differential, in terms of both economic and knowledge capital, between the technologically rich and the technologically poor. In this sense, high technology continues to maintain a distinction between a "high" and a "low" culture, between those who have a "high" level of access to technology and those who do not. Thus, despite the pronouncements of various technological "visionaries" and corporate chiefs detailing how "high tech" will "democratize" society, enabling universal access, participation, and control over one's life, high technology remains a "tool" for distinguishing social classes.

Yet, at the same time, high tech also involves—and indeed, seems to highlight—a noninstrumental or "nontechnological" aspect that, as Heidegger observes, has been largely obscured in the modern conception of technology. In fact, this "nontechnological" aspect—crucial both to Heidegger's "essence of technology" and to "high tech"—is linked to a realm that has generally been cast as the polar opposite of modern technology: that of art and aesthetics.

From its very beginnings, in fact, the conception of technology in Western culture seems to have been defined by its shifting relationship to

the realm of art. Thus, for example, Heidegger finds that in the Greek root of technology, *technē*—generally translated as "art," "skill," or "craft"—technology and art were closely linked. For the Greeks, "it was not technology alone that bore the name *technē*," but art too "was simply called *technē*" (*TQCT*, p. 34). Heidegger's point, however, is not that technology's close relationship to art in ancient Greece has simply been lost. Rather, he argues that the relationship between art and technology, so visible in the Greek *technē*, has always been basic to technology, to its "essence," even when the *conception* of technology has been explicitly posed (as it has in the modern, instrumental conception of technology) in contrast to art, to the aesthetic sphere. High tech, with its emphasis on issues of representation, style, and design, seems to signal a reemergence of this repressed aesthetic aspect within the conception of technology.

Unlike modern technology, high tech can no longer be defined *solely* in terms of its instrumentality or function—as simply a tool or a means to an end. In high tech, rather, technology becomes much more a matter of representation, of aesthetics, of style. This concern with representation and style displays itself not only in the design of technological objects themselves, but also in the practice of imparting a "high-tech look" or style to objects that are not in themselves highly technological. Thus, items as various as basketball shoes and exposed pipes and ducts have been described as having a "high-tech style." In "high-tech design," then, the modernist ideal of functional form has been largely abandoned in favor of a technological look or style that need not be functional in any traditional sense; the efficacy of such items becomes, for the most part, a matter of cultural style, cultural desires. Yet, the high-tech concern with style and stylishness is not limited to questions of design; in high tech, the very "function" of technology becomes a matter of representation, style, aesthetics—a matter, that is, of technological reproducibility. In high tech, the ability to technologically reproduce, modify, and reassemble stylistic or cultural elements becomes not merely a means to an end, but an end in itself. This process of technological representation, of reproducibility, alteration, and assemblage, can be said to define high tech. High technology is simulacral technology: a technology "of reproduction rather than of production," as Fredric Jameson has said of late-capitalist or postmodern technologies.[5] What this technology reproduces—and thus puts "into play"—is representation itself, style itself. But then, representation and style have always been technological, supplementary, simulacral. In high tech, however, this simulacral status becomes an end in itself, rather than merely a means to an end or a copy of an original.

To speak of a high-tech aesthetic or style is not, then, simply to speak of a particular look or style, but of a cultural concern with "stylishness," with "aesthetics," that is intrinsic to high tech. Indeed, high tech is by definition a technology that is "at the state of the art in terms of . . . function and design."[6] To be "at the state of the art" implies not only a certain up-to-the-second currency, an attention to the latest technological developments, but also a sense that both "function and design" have become elements in an aesthetic process or movement. As state-of-the-art technology, high tech comes to be defined by its status as the "cutting edge" or "leading wave" of this technological aesthetic or style. Indeed, it is no coincidence that the often overblown rhetoric associated with high tech is reminiscent of the manifestos and slogans of the avant-garde artistic movements of the early twentieth century. High tech is, in fact, often presented as a kind of avant-garde movement.

There are, of course, good reasons to be extremely skeptical of the "avant-garde" rhetoric of high tech (as there are, for that matter, of the rhetoric of the modernist avant-gardes). If the rhetoric of the modernist avant-gardes served to distinguish an artistic vanguard from the rest of the population, the notion of a high-tech avant-garde privileges a "highly technological" vanguard that is also, often, "highly capitalist." Yet, one crucial similarity that high tech does share with the modernist avant-gardes is that in both, the conjunction of the technological and the aesthetic is a central concern. Moreover, the very fact that metaphors such as "state of the art" and "avant-garde" have been so commonly employed—and accepted—in describing high tech is evidence that an "aesthetic" dimension has become part of the definition of contemporary technology. Technology has come increasingly to be seen as a matter of aesthetics or style, as an "aesthetic movement." Given this "aesthetic" aspect, the concept of technology in high tech might well be thought of as a kind of *high technē*—analogous to, though certainly quite different from, the Greek notion of *technē*.

The question, then, of how the modern conception of technology has changed to a *high technē* will necessarily involve charting the vicissitudes, the history, of the relationship between the technological and the aesthetic in modernity and beyond. Charting that history is, in fact, the project of this book. The book is, therefore, divided into two sections of two chapters each, with a transitional chapter between them: the first two chapters deal with the beginnings of this shift in the conception of technology and of aesthetics, concentrating on relations of art and technology in artistic modernism; the last two chapters focus on high tech itself, and

on how the conceptions both of technology and of the aesthetic have changed in contemporary times. This project is not, however, simply a matter of describing *what* has changed, of comparing "snapshots" of the conception of technology "before and after" an epistemic, postmodern break. Indeed, this book suggests that this shift should be seen neither as revolutionary nor as simply evolutionary, but instead as an "emergent" process, in which a complex interaction of factors leads to a major change. To this end, the middle chapter (chapter 3) focuses on the modernist avant-gardes as a crucial transitional phase—and, as noted earlier, one that is still quite relevant—in the emergence of high tech out of modernist technological aesthetics. Throughout the book, in fact, the issue of *how* these changes in the conception of technology and the aesthetic took place has been emphasized over the question of *what* has changed: what, for example, was there in the modern conception of technology—and in its relation to aesthetics—that enabled the concept of high tech to develop out of it? In this regard, Heidegger's notion of the "essence of technology" seems to offer a suggestive way to conceptualize how this shift comes about, prior to the more detailed discussion of the movement from modern technology to high tech that will emerge in the chapters that follow.

The Turning of Technology

For Heidegger, this "essence of technology" cannot simply be defined in terms of the usual, modern sense of technology as an instrument, tool, or machine. He attempts instead to broaden the notion of technology into a more general concept of making or producing, including artistic production. The "essence of technology" is therefore not a static conceptual category or ideal, but a dynamic, ongoing process or movement. Thus, for example, Samuel Weber can translate Heidegger's *Wesen* as "goings-on," and can note that "As something that goes on, technics moves away from itself in being what it is."[7] In other words, the essence of technology is a matter of an ongoing change or movement that Heidegger refers to as *Entbergung*, a term that is usually translated as "revealing" or "disclosure." Yet, as Weber argues, *Entbergung* might also be translated as "unsecuring," because it also carries the implication of "a dismantling, an unleashing or releasing of an ambiguous, indeed highly conflictual dynamic."[8] As a form of *Entbergung*, then, technology has always been an ambiguous movement or process. It involves a "setting up" or "setting forth" that brings things into representation, sets them in place, in order. Yet, this setting in place or into representation can only "take place" inasmuch as

technology is, at the same time, an unsettling movement or change (as in "setting forth" on a journey): an unsecuring that breaks things free and brings them forth, into representation, into play.[9]

As the essence of technology, this ambiguous representation or setting forth is present in both modern technology and the Greek sense of *technē*. Yet, the *mode* of this setting forth does change. Thus, for Heidegger, the mode of representation involved in the Greek *technē* is a form of unsecuring that is noninstrumental, and thus more closely related to artistic production *(poiesis)* than to the production of modern technology, which regulates and secures the world in instrumental terms. The world is thus "set in place" *(gestellt)*, which is why Heidegger figures the essence of modern technology, its mode of representation, as a kind of Enframing *[Ge-stell]*. Thus, while Enframing stresses setting in place, regulating, and securing, the emphasis in technē is on setting free, on unsecuring, on allowing the world to be "brought forth" in noninstrumental terms.

For Heidegger, the history of modernity can be read as an ever-increasing technological effort to regulate and secure the unsettling, "artistic" aspects inherent in technē. Through this Enframing, the unsecuring tendency of technology is given a set destination, directed toward instrumental ends.[10] Indeed, humanity is itself subjected to this kind of instrumental ordering. Yet, the unsecuring tendency of technology does not simply fade from the scene, but remains within Enframing.

Although Heidegger would have no doubt objected to such a comparison, his notion of an "unsecuring" aspect within Enframing is strangely similar to the role of "mechanical reproduction" within modern technology. Both Heidegger's concept of unsecuring and Walter Benjamin's idea of mechanical reproduction—or, translating his German more precisely, technological reproducibility—are "dismantling" processes. Just as technological reproducibility breaks down the "enchantment" or "aura" of the aesthetic realm, allowing art to become functional, unsecuring allows a mythic or "enchanted" view of the world to be broken down and thus transforms the world into objects that are available for human use and control. Moreover, as Samuel Weber has noted, the process of unsecuring actually serves as a motive force for modern technology's attempts to control and secure the world in instrumental terms: "The effort [to establish control and security] is all the more 'frantic' or 'furious' *(rasend)* because it is constantly goaded on by the unsecuring tendency of technics as such."[11] Technological reproducibility seems to work in a similar way: although it involves an attempt to extend an instrumental rationality to the realm of art, in so doing, it produces a proliferation of images and

data that have been broken free of any set meaning or context and that therefore require increasing efforts to resecure them in instrumental terms. Paradoxically, however, the extension of an instrumental rationality also extends the unsecuring tendency of technological reproducibility. In a high-tech world, then, the proliferation of technological reproducibility begins to outstrip the ability to resecure it. Here, technological reproducibility becomes an end in itself, no longer governed by an instrumental rationality, but only by its own reproductive logic, its own "aesthetic."

Despite his obvious discomfort with technological reproduction, Heidegger may have intuited this possibility of the modern, instrumental conception of technology reaching a point where it begins to undermine itself. In an often-ignored passage, he notes the "astounding possibility" that "the frenziedness of technology may entrench itself everywhere to such an extent that someday, throughout everything technological, the essence of technology may come to presence in the coming-to-pass of truth" (*TQCT*, p. 35). Thus, the extension of Enframing may itself lead to the "coming-to-pass" of a conception of technology more in keeping with the unsettling artistic "essence" that remains, ongoing, within it. This emergence of a different conception of technology out of the older modern notion cannot, therefore, be seen simply as a break; it might better be described, to use a Heideggerian term, as a "turning."

Here, however, it is not only the conception of technology that has changed, but also the notion of aesthetics. The aesthetic can no longer be figured in the traditional terms of aura and wholeness, nor in the modernist terms of instrumentality or functionality. Like technology, it too comes to be seen as an unsettling, generative process, which continually breaks elements free of their previous context and recombines them in different ways. In this way, the technological and the aesthetic begin to "turn" into one another. And although this coming together of technology and art may be very different from what Heidegger had in mind in his notion of technē, it still seems appropriate to refer to it as a high technē.

Modernist Aesthetics: The Aesthetic Turn

This "aesthetic turn" in the conception of technology does not, however, begin only with the inception of "high tech." Its beginnings can readily be seen in that strange conjunction of the technological and the aesthetic that occurs in the modernist aesthetics of the late nineteenth and early twentieth centuries. In fact, modernist aesthetics has often been defined precisely in terms of its relation to technology. Yet the relation between

technology and the aesthetic within artistic modernism is a complex one, and cannot be defined, as it all too often is, simply in terms of a tendency toward "functional form" or a "machine aesthetic." Any consideration of the technological and the aesthetic within modernism must take account not only of this tendency to "technologize aesthetics," but also of the opposite tendency, as evidenced in the Nazi desire to "aestheticize politics"—or, more precisely, to aestheticize modern technological society. Nor can we ignore—especially given Heidegger's associations with National Socialism—the extent to which his notion of an aesthetic turning in technology is implicated in the Nazi vision of an aestheticized technological state. Yet the question here is not simply Heidegger's relation to fascism, but that of modernism more generally. For within modernism, the desire to "aestheticize technology" is not limited to those who express explicitly reactionary or fascistic political sentiments. Indeed, it occurs with such regularity—even among the left avant-gardes—that it must be considered as much a part of the definition of modernism as the much more commonly noted tendency to "technologize aesthetics."

The aestheticist impulse in modernism continually returns to romantic notions of the aesthetic—or of beauty, at least—as an eternal or spiritual realm, unchanging and whole. Yet, although romantic aesthetics generally figured the wholeness of the aesthetic object in terms of organic metaphors, as having a kind of indivisible life or spirit of its own, modernist aesthetics attempts to reconcile the aesthetic with the technological. To this end, it often connects the spiritual and the technological, attempting to impart a sense of wholeness and the eternal to technological forms. Thus, mathematical and abstract geometric forms are figured as having spiritual attributes, as reflecting eternal forms and values. Often, as in Bruno Taut's Glass Pavilion, these aestheticized technological forms were explicitly designed as a kind of spiritual edifice, a symbol of unity for the fragmented modern city. Through this aestheticized technology, not only is the aura of the artwork maintained, but there is often an attempt to extend it to society in general, as a means of reinvesting modern society with a sense of spirituality and wholeness.

Modernism, however, never seems able to recognize the shift in the conception of technology that begins in its own attempts to merge technology and art. It continues to conceptualize technology almost entirely in the terms of instrumentality and functionality. The modernist desire to "technologize art" is, in fact, based on its desire to make art practical, functional. Engineering and mass production come to be seen as models for a new artistic production, which would turn away from bourgeois

aestheticism in favor of a more technological and supposedly more democratic approach. Mass production, in other words, tends to be equated with the good of "the masses." In this approach, a house is to be a mass-produced "machine for living in"[12] and the object of design is to be "of no discernible 'style' but simply a product of an industrial order like a car, an aeroplane and such like."[13] Thus, at the level of production, art is to be subjected to a standardization and rationalization similar to that of the Fordist factory, while at the level of use, the artistic object is increasingly conceptualized in practical or functional terms. In both cases, an instrumental or technological rationality is to be applied to art, stripping it of superfluous ornamental and ritual value. The result is a new "machine aesthetic" in which form is to follow function.

Viewed in this sense, artistic modernism can be seen as simply a continuation of the larger "project" of modernity, generally taken to begin with the Renaissance rise of a rationalist, scientific-technological conception of the world. This view of modernity, however, is based on a distinction of modernity from what is seen as an older, mythical, or magical thinking, which perceives the world as animated or "enchanted" by a spirit or essence beyond human rationality and control. Modernity has therefore presented itself as a rational "enlightenment" of a world shrouded in the darkness of myth and superstition, as a disenchantment or demythologizing that divests the world of any magical essence or spirit. In effect, modernity strives to "kill" the "spirits" that animate the world, to render the objects of the world as "dead," and therefore liable to rational use and control. In fact, it is only with the "death" of magical or animistic beliefs that the utopian project of modernity—the dream of rational enlightenment, of scientific-technological progress—can be "born."

In a very similar way, artistic modernism has been seen—and, especially in the case of the 1920s avant-gardes, has seen itself—as demythologizing or destroying the magical or ritual value of the aesthetic sphere. This "technicist" tendency is obvious in the work and statements of various avant-garde movements, from Soviet Constructivism and Productivism to de Stijl to the Bauhaus. In quite similar terms, of course, Walter Benjamin would later trace the destruction of the artwork's "aura" to the rise of technological reproducibility. Benjamin, in fact, will find the modernist "emancipation" of "constructive forms" from art directly analogous to the freeing of the sciences from philosophy in the Renaissance.[14] According to this view, then, just as modernity's scientific-technological, instrumental view of the world is predicated on the "death" of animistic, magical, or spiritualized conceptions of the world, so too

is artistic modernism premised upon the "death" of the aura, which Benjamin defines precisely as that sense of an autonomous, "living" spirit that "animates" the work of art.[15]

Modernism, then, equates technological reproduction—and its related techniques of assemblage, collage, and montage—with the rationalization and functionality of mass production. Montage and assemblage techniques are seen as analogous to the practices of factory assembly lines, and their "products" are viewed as similarly functional. As Peter Wollen notes of Walter Benjamin's theories, "His modernist transformation of aesthetics is founded on the postulate of Fordism, capitalist production in its most contemporary form. Just as the Model T replaces the customized coach or car, so the copy replaces the original."[16] Viewed in these terms, the very idea of technological reproducibility and assemblage comes to be seen as inherently functional—as does any object made using such techniques.

Yet, this belief in "functional form," in a "machine aesthetic," betrays the extent to which modernism misunderstands its own "aesthetic" uses of technology. Indeed, modernist aesthetics is very often based on "the myth of functional form." Taking technology and mass production as models for art and artistic production does not, after all, make modernist art inherently more functional. As Reyner Banham has shown in discussing architectural modernism, its "functional forms" were rarely particularly technological or functional; they merely "looked" technological, functional.[17]

The analogy that modernism attempts to draw between the functionality of mass production and technological reproducibility is similarly flawed. In both cases, modernism conflates productive functionality with efficacy of use or representational efficacy. Although rationalization and standardization may make factory production, and perhaps its products, more functional, the efficacy of, for example, a photograph or film is only minimally related to the rationalization and standardization of its production.

The "machine aesthetic" of modern design was, then, precisely that: an aesthetic, a style, a simulation of the rationalized, standardized forms of machines and factories, often abstracted from any functional or instrumental context. Here, the "aesthetic" of functional, technological form leads modernism—albeit unknowingly—to a conception of "technology" that is less a matter of functionality or instrumentality than of style, of aesthetics. The machine aesthetic's simulation or reproduction of "technological style" enables technological form to be separated from

function; it allows a technological style or aesthetic to be "freed" or "unsecured" from its previous, functional context. This capacity for simulation or reproduction is only enhanced by the rise, so crucial to modernist aesthetics, of technological reproducibility. If the machine aesthetic's reproduction of technological style splits style from function, with the rise of technological reproducibility, the function of technology itself begins to become a matter of reproduction, of simulation.

Yet, as modernism begins to link the aesthetic and the technological, the two begin to become confused. Even as the conception of technology begins in modernism to undergo an "aesthetic turn," so too does the conception of "the aesthetic" undergo its own "technological turn." Modernism's efforts to "kill" the aura, to make art more functional and more technological, may indeed be seen as an attempt to extend an instrumental or technological rationality to the realm of art, and to cultural forms more generally. Yet this extension itself leads to a "turning" in the notion of both technology and the aesthetic. In "aestheticizing" the functional and the technological, modernism separates technological form from function; it allows stylistic or aesthetic elements to be "unsecured" from their previous context and to be recombined or reassembled into new configurations according to the dictates of "style," of "aesthetics." Yet, the "aesthetic," as it comes to be seen in terms of the technological, moves away from romantic notions of wholeness and spiritual value; in other words, it loses its sense of aura. As such, the aesthetic will become indistinguishable from culture more generally. The aesthetic, in short, becomes a matter of style, a technological or techno-cultural style. Here, both the technological and the aesthetic have become techno-cultural.

The Aesthetics of High Tech

The high-tech aesthetic obviously draws heavily from, and in fact develops out of, the modernist "machine aesthetic." In both, technology is reproduced as an aesthetic phenomenon, as a look or style abstracted from a functional or instrumental context. The modernist machine aesthetic, however, continues—at least at an explicit level—to hold to the myth of functional form. It never acknowledges that, in its abstraction and reproduction of technological form, its "aestheticization" of technological style, form has been separated from function. In the high-tech aesthetic, on the other hand, this separation of technological form and function is often readily apparent, as in the definition of "high-tech design" as "a style or design or interior decoration that uses objects and articles normally found in factories, warehouses, restaurant kitchens, etc., or that imitates

the stark functionalism of such equipment."[18] Here, as in the "machine aesthetic," it is the abstraction and reproduction—the simulation—of technological forms or elements that "turns" them into stylistic or aesthetic elements, into a high-tech style. Yet, the high-tech aesthetic is not simply a matter of the reproduction, and consequent "aestheticization," of technological forms. It involves a much more general process of technological reproducibility, in which it becomes possible for any cultural form or element to be abstracted or unsecured from its previous context—videotaped, digitized, reproduced, altered, and reassembled. As it is generalized throughout contemporary culture, this process of reproduction can no longer be seen as determined by some notion of functionality; rather, it takes on its own "aesthetic" logic, replicating, recombining, and proliferating. Shorn of both its aura and its use-value, aesthetic production becomes indistinguishable from cultural production. It becomes, in other words, a process of pastiche.

Because it is defined by this process of technological reproducibility and pastiche, the high-tech aesthetic should not be viewed as a particular style or stylistic tendency. The notion of "high-tech style" has been applied to everything from starkly minimalist, "functionalist" interior design to the complex circuitry of the microprocessor. Yet, high-tech minimalism and high-tech complexity do have more in common than their use of *high-tech* as an adjective. Minimalism and complexity may in fact be seen as the two basic, and related, aspects of high-tech style or aesthetics. The tendency of high tech toward minimalist design, inherited from aesthetic modernism, is actually an extension of modernity's tendency to technologize or instrumentalize the world, to abstract and reduce it into ever more minimal, more controllable forms. It is this process that leads to the increasing technological reproduction and digitization of the world, its reduction into increasingly smaller, and supposedly more manageable, "bits" of data.[19] Paradoxically, however, as ever more data is produced, this process inevitably leads to a multiplication of the very elements it attempts to control. This proliferation of data, then, leads to an increasing level of complexity. In precisely this way, the minimalist tendency of high-tech aesthetics is inextricably linked to the complexity that is also associated with high tech.

At a certain point, this process of ever-increasing technological complexity begins to appear as a kind of cultural mutation. It begins to seem, and perhaps to become, autonomous, beyond the ability of humanity to know and control. At this point, technology becomes techno-cultural. It is precisely this sense of an incomprehensible techno-cultural complexity

that is figured in the integrated circuits and microprocessors that make up the interior of most high-tech devices, as well as in all those figurations of an immensely complex circuitry or informational matrix made popular by postmodern and cyberpunk science fiction. Indeed, the sense that a techno-cultural mutation has taken place often seems directly related to the sense of being immersed in this sort of technological complexity—to that commonly observed sense that "we are already in the matrix."

The Technological Memory

This sense that a cultural, or techno-cultural, mutation has "already" taken place often seems like—and in fact has often been—the stuff of science fiction. Yet, it is not limited to science-fiction texts; it also underlies much of "postmodern theory." But then, when theorists such as Donna Haraway speak of "a kind of science fictional move, imagining possible worlds," and science-fiction writers such as William Gibson and Bruce Sterling suggest that our world has already become science-fictional, the distinction between theoretical and science-fiction texts seems to have become less and less the point.[20] Indeed, this intermingling of "theory" and "science fiction" may itself be seen as a "mutation" that results in a more complex, hybrid or—in deference to Haraway—"cyborg" form. Yet, this mutational, "science-fictional" theory is also a response to the complexity of the techno-cultural world, which makes the traditional position of the theorist—the position of an active, knowing subject distanced from a passive object-world—more and more untenable. Faced with a complexity that seems to defy any totalizing, "theoretical" comprehension, both theorists and science-fiction writers have attempted to find new ways to theorize this techno-cultural complexity, and their relation to it.

One of the most popular means of representing this relation has been to figure the human subject as immersed in a vast and inescapably complex technological space. It is precisely this figuration that links, for example, Fredric Jameson's theorizing of contemporary "postmodern space" to the depiction of near-future urban sprawl that has become so familiar in recent science-fiction literature and cinema. Indeed, the dense, "tech-noir" pastiche that surrounds the viewer in such films as *Blade Runner, RoboCop,* and *Akira,* and in cyberpunk novels such as those of William Gibson, has much in common with Jameson's vision of the "bewildering immersion" evoked by "postmodern hyperspace" (pp. 43–44). In both cases, this space is presented as a kind of mutation. In both cases, too, it is viewed as explicitly technological, not in the sense of an older, modernist aesthetic of machinery—which is present only as an allusion, as part of a pastiche of past styles—but in the sense that it is constituted through technological reproduction: it is a space of surfaces, images, simulations, empty signifiers—a space, that is, of information, of data.

It was Gibson, of course, who gave this notion of an immense, simulated data-space what has proven to be its definitive representation in his depiction of "the matrix," a future cyberspace in which "data abstracted from the banks of every computer in the human system" is given graphic representation. As in the computers and computer networks from which Gibson drew the idea, the space of the matrix is not a physical space, nor can it be figured simply in terms of technological hardware. Although computers offer various kinds of hardware for the storage of data, from chips to hard drives to CD-ROMs and DVDs, this storage space cannot be accurately described as a hardware-space. It might, in fact, better be called a media-space, as suggested by the fact that these forms of storage are known as "storage media." The space of this data is, then, a multimedia space, constituted through simulation, through technological reproduction and reproducibility. The name generally given to this simulacral, virtual space is, of course, *memory.*

Yet, what is represented in Gibson's matrix is not simply the memory-space of computers, any more than Jameson's portrait of the spaces of the Westin Bonaventure is simply a matter of architectural space. Both can, in fact, be seen as attempts to represent the "unrepresentable" space of contemporary, postmodern techno-culture. Yet, if Jameson tends to figure this space in terms of an "overwhelming," schizophrenic pastiche of images and simulations, Gibson imagines it as a kind of technological memory: a random-access memory of cultural data and styles. In this space, technology can quite literally no longer be seen as machinery, as hardware. Rather, technology becomes increasingly a matter of technologically reproduced information: images on a videotape, scenarios of a computer game, Web sites on the Internet. This is the paradox of high-tech aesthetics: as the *form* of technology edges toward "invisibility," technology increasingly comes to be seen in the form of data or media.

At an even more general level, however, this shift in the conception of technology means that, as the cultural world around us becomes ever more liable to technological, digital reproduction, any distinction between technology and culture begins to vanish. Technology comes increasingly to be seen as a matter of cultural data, as a matter of techno-culture. Technology, in short, comes to be seen precisely in terms of that

pastiche of reproductions, of cultural images and data, that make up what might be called the techno-cultural memory.

Yet if, as Gibson suggests, the data of this techno-cultural memory can be randomly accessed, it cannot be accessed in its entirety. As with a computer, the data in memory must be mediated, called up on a screen. This process of screening is necessarily partial: though data may be viewed from many angles, and in many formats, though it may be processed and reconfigured, it can never be represented as a whole. Indeed, this is, perhaps, the very definition of data. But then, memory can never be fully present. As Jacques Derrida has noted, "Memory is finite by nature. . . . A limitless memory would in any event be not memory but infinite self-presence. Memory always therefore . . . needs signs in order to recall the non-present, with which it is necessarily in relation."[21] Inasmuch as memory is always mediated through signs, images, representations, it is already technological, already a matter of screening. In this sense, total recall—or at least a whole or "global" recall—is a myth.

The screening of the techno-cultural memory should not, then, be seen as a "screen memory," in Freud's sense of the term. Despite Jameson's view that multinational capitalism is a kind of inaccessible primary scene at the base of "representations of some immense communicational and computer network" such as Gibson's matrix (p. 37), there is no "real," "original," or "whole" scene that lies hidden behind the screen. All views of the data in the techno-cultural memory are partial and contingent; other combinations are always possible. Indeed, every screening creates new juxtapositions and configurations of data, new reproductions and images. The contingency inherent in the screening of techno-culture is, therefore, an effect of the proliferation of images and reproductions in memory—an effect, in other words, of what Gibson refers to as an "unthinkable complexity." The techno-cultural memory has simply become too dense, too complex, to be thought or represented as a whole; techno-culture—and with it, technology—has instead come to be seen as an ongoing process of screening, of multimedia.

This techno-cultural screening might well be seen as a new mode of Heideggerian *Entbergung*, with the same sense of an ambiguous dynamic. Although some, like Jameson, would see this screening, like Heidegger's notion of Enframing, solely as a process of regulating and securing the techno-cultural world in instrumental, or capitalist, terms, to do so is to neglect the extent to which it is also a process or movement of unsecuring, which takes place without regard for capitalist, or even for human, ends. For although, at the level of individual cases, screening a video,

playing a computer game, finding information on the Web, or making money by providing these services may be quite instrumental, when the process is viewed on a larger scale, when all the complex interactions between its elements come into play, it becomes much more difficult to conceptualize as simply a matter of an instrumental rationality or Enframing. It becomes much less a case of humans screening data for their own use than of techno-culture screening itself.

Technological Life, Technological Agency

The screening of techno-cultural memory has, in an age of high tech, begun to seem beyond human instrumentality and control; it no longer seems to function according to an instrumental rationality, but according to a much more unpredictable "techno-logic" of its own. Here, then, not only has the conception of technology undergone a mutation, but technology has itself come to be seen as a mutational process or logic. The process of screening mutates the very images and data that it reproduces. By definition, this mutational process is—as all mutation is—unsettling, aleatory, beyond human prediction or mastery.

As so-called chaos theory has shown, it is precisely when a space or system reaches a certain degree of complexity that its processes become unstable, unpredictable, chaotic, that mutation occurs. As the process of screening advances, as its reproductions are themselves reproduced, and reassembled, and bits of them reproduced again, the space of techno-cultural memory becomes ever larger and more complex. Consequently, it becomes less and less likely that the complex series of interactions, alterations, divisions, and combinations possible within that space can be foreseen, much less controlled. Even within the memory-space of the individual personal computer system, it is not always possible to foresee the problems or "bugs" that result from the interaction between various types of software. When systems are interconnected into larger networks, the possibility of "bugs" tends to increase with the complexity of the overall network. Speaking of just such a "bug" that caused the 1989 shutdown of more than half of AT&T's long-distance lines, a company technology director observed: "When you're talking about even a single system, it's difficult. But when we're talking about systems of systems, then the risks are greater. All of these stored programs are interacting with each other and that makes it hellishly difficult."[22]

Such "bugs" are, of course, still a far cry from the science-fictional computers or robots that attain sentience as a result of some random conjunction of events (short circuits, lightning bolts, a spilled soft drink,

etc.). Yet, the very name "bugs" suggests that a certain agency, and indeed, a certain "life," is attributed to these technological mutations. Mutation is, of course, a biological term, associated not only with life but with the reproduction of life. It is not, therefore, surprising to find the notion of a mutant technology—of technology as a process of continual reproductive mutation—frequently figured as having a life of its own. Often, such reproductions of technological life have been represented as threatening and out of control, as monstrous, or, especially given their tendency toward mutational reproduction, as cancerous or viral. Indeed, the metaphor of the computer virus suggests both the threat and the unsettling promise associated with this kind of self-replicating, mutational technological life.

Any representation of a technology that seems to have taken on its own mutational life, or at least its own agency, is bound to seem "science-fictional." Yet, these "science-fictional" representations of technological life have also, at times, invoked the return of older—or at least other—representations that have been excluded or repressed by modern scientific-technological thought, representations in which agency is not the exclusive property of a human subject. In other words, a technological life or agency that is seen as "beyond" human control or prediction often seems to invoke a sense of those "older" supernatural or magical discourses that modernity, believing itself to have surpassed, figures as "dark," "irrational," "superstitious," and "primitive."

In an age of high tech, however, this return of the magical or the spiritual in representations of technological life no longer seems to be seen as simply monstrous or threatening. Thus, for example, movements and discourses as various as techno-paganism, "new-edge" science, cyber-shamanism, and rave culture have drawn on magical, spiritual, and metaphysical discourses to figure their own relation to a technology, to a techno-cultural space or world, that often seems to have taken on a life of its own.[23] Techno-pagans, for example, see the techno-cultural world as magical, as inhabited by unseen forces, spirits, gods. They therefore interact with technology not simply as an instrument or tool, but as something with its own autonomy or agency, which is not simply under their control. Yet, they do not then see this technology simply as dangerous, "out of control," or monstrous. Their relation to it is more a matter of interaction, cooperation, respect—of allowing that technological agency to go on in its own terms, and even to be guided by it. A similar figuration of a magical or spiritual technological agency appears in William Gibson's *Count Zero*, where sentient artificial intelligences begin to manifest themselves in the matrix in the form of Afro-Haitian loa, fully capable of controlling events and guiding their human "horses."[24] As is obvious in both of these examples, magical or spiritual representations of a technological life tend to unsettle the distinction between subject and object that underlies the universalizing conception of the modern human subject and its relation to an instrumentalized world. As is perhaps also obvious, the prominence of a matriarchal spiritual discourse in techno-paganism and of Afro-Caribbean religious discourse in Gibson's portrayal of cyber-spatial loa serves to suggest that the "return" of such magical discourses in representations of technology tends to involve a return of those racial and gender differences repressed by the patriarchal, Eurocentric conception of the modern human subject.

As is evident in these examples, a mutation seems to be taking place in not only the modern conception of technology but also the conception of the human subject. If modernity has defined "the human" by its status as a subject—that is, by its presumed mastery over the world—then the growing acceptance of a notion of autonomous technological agency necessarily brings that status into question. It is for this reason that attempts to figure a new relation to technology so often draw on "pre-modern" models, in which human beings are defined not simply by their status as active, controlling subjects, but by their connection to and participation in a world of "other" forces and agencies. In a high-tech world, this sense of "connection"—of being immersed in the techno-cultural world that surrounds us—seems to be heightened. In such a world, the human relation to technology—and with it, human identity itself—must be imagined in new ways.

Donna Haraway's notion of the cyborg is, in fact, an attempt to represent this mutation of identity, to figure a new, hybrid, and science-fictional positionality from within a techno-cultural world or space.[25] Haraway's cyborg is not, as is often the case with the more masculinist cyborgs of Hollywood films, merely a reproduction of the same old (white male) human subject, whose sense of mastery and autonomy is now protected against incursions by an armored, technological shell or body. For Haraway, the "cyborg subject position" is not stable, but mutational; it is not homogeneous or whole, but mixed, hybrid. As such, it necessarily disorganizes the boundaries between "the human" and its others, between a "living" subject and a "dead" technology. The cyborg is less a matter of identity than of a relationality that acknowledges difference within itself, rather than simply externalizing it as a monstrous other. To be a cyborg, then, is to take part in the complex reproductive

processes of techno-culture, but also, by this interaction, to generate new combinations and patterns.

A similarly complex, hybrid relation to technology and to otherness can be found, as Haraway has herself observed, in the science fiction of Octavia Butler. In Butler's work, the conception of a human subject is often put into question, whether by incorporation as alien breeding partners in "Bloodchild," by the mutations brought about by an alien virus in *Clay's Ark*, or by genetic merger with an alien species in her "Xenogenesis" trilogy.[26] For the aliens in her "Xenogenesis" series, the Oankali, the distinction between technology and life has in fact ceased to exist. Technology is not for them a "dead," external instrument, but part of them. As Haraway points out, "Their bodies themselves are immune and genetic technologies, driven to exchange, replication, dangerous intimacy across the boundaries of self and other, and the power of images."[27] The "technological" bodies of the Oankali, then, are driven by a logic not of technological but of *biotechnological* reproduction, mutation, generation. Their very essence is, in fact, hybrid and mutational, defined over millennia through continual genetic merger and exchange. Literally heterogeneous, the Oankali, like Haraway's cyborg, unsettle the traditional boundaries that have defined the privileged position of the (usually white, male) human subject. Not surprisingly, given their threatened dismantling and "incorporation" of the elements of "humanity," the Oankali appear to the human characters in Butler's story as monstrous. Yet, at the same time, they offer the promise not only of survival, but of a change or mutation that will generate new and unforeseeable possibilities, a new species.

Both Butler's Oankali and Haraway's cyborg open the possibility of seeing technology differently—as something that, like "life," not only has its own agency, but contains its own generative, reproductive possibilities. Seen in this sense, technology becomes an ongoing process of mutation, of reproducing, reassembling, generating, that functions not so much in terms of "Enframing," but in terms of its own unsettling logic, its own mutational "aesthetic." In an example that almost seems designed to illustrate this idea, William Gibson, in *Count Zero*, describes an artificial intelligence (AI) that devotes itself to the creation of exquisite shadow boxes, assembled from the detritus of techno-cultural memory. Here, a techno-logic of reproduction has indeed become a form of technē, which continually unsecures and reassembles the elements of a techno-cultural world or space in a context that can only be described as "aesthetic."

Gibson's "artistic" AI is, of course, merely a metaphor for a different conception of technology, a different relation to the techno-cultural world. Yet, although this representation of a generative, "artistic" techno-logical agency may be figurative, this is not to say that it is simply a mystification, that it is atheoretical, or simply false. It is, after all, no more figurative than Jameson's theoretical figure of a "global cognitive mapping" that would allow a broader understanding of postmodern space. Indeed, as Jameson himself suggests, in a techno-cultural space that is too complex and chaotic to be represented as a totality, such figures are perhaps the only way to theorize our relation to the techno-cultural world around us. This kind of figurative, "science-fictional" theory is precisely what Haraway, Butler, Gibson, and the techno-pagans are engaged in.

Yet, these "science-fictional" figurations should not be understood simply as the invention of human subjects; they are at least equally the result of the generative, mutational processes of techno-culture itself. If the space of techno-culture can only be represented as the complex, mutational space of memory, its processes might themselves be figured as those of a technological, or techno-cultural, unconscious. For, indeed, doesn't the logic of techno-cultural reproduction and mutation seem to follow exactly the logic of the signifier? But then, the unconscious may itself be seen as technological, if not in the instrumental sense, then in the sense that it is an ongoing process of unsecuring, of reproducing, that breaks images and other elements free of their previous context and recombines them to generate new figures, charged with both monstrosity and promise.

The position of human beings in relation to this techno-cultural unconscious cannot, therefore, be that of the analyst (or theorist) who, standing outside this space, presumes to know or control it. It must instead be a relation of connection to, of interaction with, that which has been seen as "other," including the unsettling processes of techno-culture itself. To accept this relation is to let go of part of what it has meant to be human, to be a human subject, and to allow ourselves to change, to mutate, to become alien, cyborg, posthuman. This mutant, posthuman status is not a matter of armoring the body, adding robotic prostheses, or technologically transferring consciousness from the body; it is not, in other words, a matter of fortifying the boundaries of the subject, of securing identity as a fixed entity. It is rather a matter of unsecuring the subject, of acknowledging the relations and mutational processes that constitute it. A posthuman subject position would, in other words, acknowledge the otherness that is part of us. It would involve opening the boundaries of individual and collective identity, changing the relations

that have distinguished between subject and object, self and other, us and them.

This change is itself a mutational process that cannot be rationally predicted or controlled; it can only be imagined, figured, through a techno-cultural process that is at once science-fictional and aesthetic. It is only through opening ourselves to this kind of creative process, by taking part in the complex web of relations in which we are implicated, rather than simply trying to control them, that we can hope to imagine, to bring to representation, a future that, though it may seem unpredictable and alien, will inevitably be our own.

RUTSKY, R.L. The Spirit of Utopia and the Birth of the Cinematic Machine. In. High technē: art and technology from the machine aesthetic to the posthuman. Minnesota: University Press, 1999.

1.
The Spirit of Utopia and the Birth of the Cinematic Machine

The historical narrative of aesthetic modernism is generally taken to have begun in the mid-nineteenth century, and the figure most often cited as its progenitor—or at least its obstetrician—is Baudelaire. In such accounts, in fact, modernism's "birth" often seems to require a doctor in attendance, for it is not an entirely "natural" process.[1] The birth of modernism involves, in other words, the reemergence of an artificial or technological element that was excluded from romantic aesthetics. Indeed, Kantian and romantic aesthetics always seemed to see the idea of a technological birth as threatening, monstrous, and any doctor connected to it as either a mad scientist or a practitioner of the black arts. Thus, the primal scene of Kantian, romantic aesthetics would be precisely this *birth of the machine*, the bringing to life of technology and technique. The repression of this scene will serve to constitute the Kantian aesthetic sphere; its "renaissance" will define aesthetic modernism.

Yet, if modernism has generally been defined by the reemergence within aesthetics of technology and technique, there is still a ghost of Kantian aesthetics in the modernist machine. Most definitions of modernism emphasize the fragmentary effects—on both space and time—of modern technology. Modernism comes to be seen in terms of its openness to the urban-technological "shocks" of the modern city, to "the 'present-ness' of the present," to that "half of art" that Baudelaire characterizes as "the transitory, the fugitive, the contingent." Such definitions, however, tend to neglect what Baudelaire calls "the other half" of art: "the eternal and the immutable." Indeed, Baudelaire himself apparently sees this aspect of art as nonmodern. It would seem, in fact, to belong to a Kantian aesthetic sphere that defines itself precisely in opposition to the fragmentation and transience of modern technological life. In this