

CHAPTER 5

Technology and Modern Existence

Frederik Ferre

5.1. THE TECHNOLOGICAL PHENOMENON

The pervasive "technosphere" with which this book began turns out to be the implementation of a kind of mentality that is characteristic of our modern age. It rests on the unique blend of techno-scientific intelligence that both creates the modern technological phenomenon, with its theory-based practical knowhow, and interprets it, with its preferred categories of explanation.

This technological phenomenon requires careful philosophical critique on both its practical and theoretical aspects. The rest of this book will indicate broad lines along which such critiques might proceed and will lay out some of the key issues for debate.

The present chapter will survey four different global assessments -- two stressing the bright and two the somber side -- of the modern technological phenomenon as a whole. Chapter 6, in contrast, will deal with norms of ethical and other kinds of assessment and with questions posed by particular major technologies. Chapter 7 will examine some central issues of religion as these relate to technological civilization. Chapter 8 will examine metaphysical questions raised by the technological phenomenon-and at the end will reopen the theoretical question (4.4) of the "finality" of the modern techno-scientific method of thought.

5.2. BRIGHT VISIONS (1): KARL MARX

Although Marx (1818-83) did not develop a detailed philosophy of technology or write compactly about the technological phenomenon, his ideas on our modern world and the significance of implemented practical intelligence are important in any survey of seminal thought on our topic. Besides their intrinsic philosophical interest, they have indirectly, through the later development of Marxism and its place in world politics, played a major role in shaping the views and circumstances of millions of persons.

a. The Primacy of the Practical

A strong theme in Marx's thought, to put it in the terms we have now developed, is the primacy in human life and history of the Reason of Ulysses. The whole human race, Marx argued, can hardly be characterized by reference to such a recent appearance as theoretical intelligence. Our species, on the other hand, is qualitatively special in the extent of our creation and use of implements and techniques to meet our needs. We are preeminently the tool-using animal.

In this approach, Marx sharply broke with the dominant philosophy of his day, the idealism of G.W.F. Hegel (1770-1831), which advanced the primacy of Spirit not only within human history but also for the universe as a whole. The proper approach, Marx believed, was the complete inverse of Hegel's. The fundamental, he asserted, is the material, not the spiritual. For the real driving forces in history, look to

the material challenges and conditions of life, particularly to the universal needs of living things to provide for their own subsistence. These needs and our methods of meeting them are in human terms the economic realities. It is these realities that stimulate the responses of Ulysses. They are what actually rule the world, however much the fact may be disguised by the glib-tongued Plato.

The abstractions of theoretical intelligence, according to Marx, are themselves products of the underlying economic realities. Such abstractions-philosophical systems, cultural styles, political theories, religious beliefs-have no force of their own. Rather, they are "ideological" in the sense that they reflect, directly or indirectly, the material interests of those who think them. Parliamentary government, for instance, is for Marx a by-product of the revolt of capitalism against the feudalistic economic order. So, likewise, is the rise of Protestantism.

b. Technology in Historical Change

The tools and implements that go into the economic methods of any historic system make up a large part of what Marx called the "forces of production." In addition there are the material circumstances that practical intelligence finds at hand, such as available raw materials or geographical features (rivers, fertile fields, and the like), that should not be classed as technology itself. These forces of production are always in interaction with the "relations of production," which are the social arrangements between persons engaged in economic activity. These arrangements need not be, but historically usually are, exploitative relations, as between master and slave, lord and serf, owner and employee.

When the relations of production provide an incentive for the innovative activity of practical intelligence, Marx believed, then (and only then) new technologies arise in human history. The relations of production for most of human history (prior to the modern capitalist era) have tended toward technological stability, but occasionally major changes have occurred. When they do occur, revolutionary changes are in store. The relations of production that stimulate the new forces of production represented by technology are threatened by their own offspring. Technology, once born, outgrows its social cradle and shatters the relations of production that called it forth.

This is because, for Marx, the new forces of production carry within them the potential to expose the contradictions, the internal weaknesses, of the earlier relations of production. Feudalism was built on the fealty between serf and lord. The serf was not a slave. The master could not dispose of serfs like property. The master had duties as well as privileges. But the serf was bound to the support of the master and to the tilling of the feudal land. Within this equilibrium the economic system could persist over long periods. But this equilibrium could not endure the economic need for the special skills -- the crafts of the glassmakers, the swordsmiths, the jewelers-that were wanted by the lords. Those crafts required some persons to be free from the constant tilling of the land and led to the growth of towns in which guilds of free craftsmen could work their arts and in which trade could flourish. The internal economic incentives of feudalism, represented by the self-interest of the feudal rulers, were self-contradictory and self-destructive, since they called for technological implementation in towns that grew to be cities of free agents-agents free from bondage to the land, some free to trade and become rich, others free to sell their labor to the highest bidder. Thus feudalism led paradoxically to its own destruction by encouraging the rise of cities in which, eventually, the bourgeoisie would form capitalism.

c. Modern Technology

Capitalism, and the modern world of constantly progressing technology, was brought into being, in dialectical revolt against the contradictions of the feudal age, by the invention of machines and factories, built by the wealthy who thereby became still wealthier through monopolizing the most effective forces of production and (in a new, uniquely capitalist relation of production) buying the labor of unattached workers at a shameful fragment of its worth.

Just as capitalism, for Marx, contains its own internal growth incentives for constantly new inventions and implements, incentives for "constant revolutionizing of production, uninterrupted disturbance of all social conditions, everlasting uncertainty and agitation," so also it contains its own internal contradictions, the seeds of its own demise, in which technology also plays a key role. The needs of the capitalist rulers lead to ever-increasing concentrations of workers, as industrial technologies in the service of profits grow larger and larger, with new markets to feed -- and feed upon. At the same time, the needs of capitalism also have led to widespread literacy, made possible by the technology of printing and made economically necessary by the factory environment in which workers need a modicum of education to function at a profitable level of efficiency. The two technological forces in combination are an explosive mixture. As the exploited workers are forced together in greater numbers by technologies of the industrial system, they also are made aware, through technologies of educational and mass communication systems, of their exploitation, of the injustice of their circumstances, and of their raw power to revolt against the masters.

d. Technology and the Future

Marx believed that the revolt of the exploited proletariat would bring a new economic order in which, eventually, there would be no contradictions between the forces and the relations of production. This would require technology at its best and most productive, to assure the post-capitalist world of conditions of material plenty such that no one would lack the goods of life. The goal would be a society in which it would be possible to ask each member of society to work "according to his capacity," while providing for each "according to his needs."

In this way, the modern technological phenomenon acts not only as a goad to profoundly needed changes in society, an intensifying stimulus to revolution against the contradictions within capitalism, but also as a lure to a new equilibrium of productive forces and social arrangements that will fulfill all human hopes. The attitude of Marx toward technology is finally hopeful. Technology does not tell the whole human story, of course, since social arrangements and natural resources are no less important factors in the economic outworking of things, but it is an indispensable and positive ingredient in the dynamics of the material dialectic of history.

5.3. BRIGHT VISIONS (2): BUCKMINSTER FULLER

R. Buckminster Fuller (1895-1983) was himself a striking phenomenon of the twentieth century. He was an engineer, an inventor, a philosopher, a prophet, and an indefatigable public speaker even in his advanced years. Fuller's best known invention was the geodesic dome, which achieved, through its geometric structure, remarkable strength per unit weight. Fuller's light and airy dome over the United States Pavilion at Expo '67 in Montreal was one of the notable sights of that world's fair.

Among other things Fuller designed his Dymaxion house and three-wheeled Dymaxion automobile, all with keen attention to mathematical relationships, function, and efficiency. It was Fuller's constant contention that by taking the right kind of thought one could do "more with less." His 90 horsepower automobile, for example, was capable of driving at 120 miles per hour.

He also reflected extensively on his inventions and designs, pushing his thought to cosmic dimensions. In the process he sometimes modified normal language patterns to suit his ideas and wrote poetry to help communicate to his often befuddled public. The poetry arose from his attempt to provide clarity by inserting breaks and pauses in the otherwise torrential flow of his language. He referred to it as "mental mouthfuls of ventilated prose" in the preface of one of his most wide-ranging and fascinating books. Most of the following discussion of his unique vision will be documented in his highly personal linguistic form.

a. The Cosmic Primacy of the Theoretical

For Fuller the distinguishing mark of the human is the Reason of Plato. The rest of the universe is "spontaneous" but the human race is increasingly reflective and aware. "The history of man seems to demonstrate the emergence of his progressively conscious participation in theretofore spontaneous universal evolution. Man seems unique in this progressive degree of conscious participation in evolution." Such reflective power is for Fuller immensely practical as well. It is the capacity that not only gives us our special status but also helps those who trust it to survive.

One of Fuller's vivid images is of the instrument pilot (or the submariner also operating on instruments) who succeeds because scientifically designed instruments are trusted rather than bodily sensory signals. In the title poem of his book, Fuller meditates on the outbreak of fighting at the start of the Second World War. An air and sea battle has occurred near Oslo.

*I think of such of the aviators and sailormen as are in command of their faculties
on both sides at this moment. Though you have been out in a froth-spitting squall
on Long Island Sound or
in an ocean liner on a burgeoning sea you have but a childlike hint of
what a nineteen-year-old's reaction is
to the pitch black shrieking dark out there in the very cold northern elements
of unloosening spring off Norway's coast tonight
15,000 feet up, or fifty under or worse,
in the smashing face of it and here I see God.*

*I see God in
the instruments and the mechanisms that work*

*reliably,
more reliably than the limited sensory departments of the human mechanism.*

*And he who is befuddled by self or by habit,
by what others say,
by fear, by sheer chaos of unbelief in God
and in God's fundamental orderliness ticking along on those dials
will perish.
And he who unerringly interprets those dials will come through.*

Every instrument pilot will testify that one must learn to mistrust the senses and to trust the gauges even when every nerve insists that they must be mistaken. A good instrument instructor will make sure that the trainee pilot experiences such a conflict under safe conditions. This can be easily induced by the instructor's banking the plane steadily for a while, unknown to the trainee, then swiftly rolling the aircraft into level flight and immediately asking the trainee to fly by reference to the instrument indications alone. One's organs of balance become quickly adjusted to the simulated gravitational forces in a coordinated turn and, if suddenly made level, they will register to consciousness a false sense of being thrown into a turn in the opposite direction. The instruments will indicate a level flight condition, but one's body screams to tilt the plane and make it "level." One must learn to believe one's mind-fed by the cool eyes that read the instruments-rather than one's body. Otherwise, in real conditions of turbulence and distraction, the flight will doubtless end sooner and sadder than intended.

The increasing instrumentation of the human race by theoretical intelligence is for Fuller what provides our species its special powers and destiny. We now know that the universe is full of phenomena that are undetectable by our naked senses. But theoretical intelligence, implemented with high technology, gives us access to these otherwise unknowable dimensions.

Man is born with an extraordinary inventory of faculties within an extraordinary inventory of universal phenomena. Most of the inventory is invisible, operating either infra or ultra to our sense apprehending. My philosophic working assumption goes on to assume that, despite the meager degree in which we consciously employ our capabilities in response to the meager degree in which we understand the universal phenomena, we were given our faculties to permit and induce our progressively greater apprehension and comprehension of the universal phenomena.

b. The Cosmic Setting of Technology

The phrase "we were given" in the previous quotation is more than a way of speaking for Fuller, since the conceptual depth and orderliness of the universe strongly suggest to him a prior coordination between our theoretical capacities and the universe itself, from which we spring. Science and technology, as Fuller sees them, are at work exploring what has already been anticipated by intellect in nature. Fuller writes about "what seems to me to be an overwhelming confrontation of our experience by a comprehensive intellect magnificently greater than our own or the sum of all human intellects which has everywhere and everywhen anticipatorily conceived of the complex generalized, fundamental principles which all together interact as universe." And if this is so, then the crucial place of modern technology for the universe as a

whole becomes clear. "My continuing philosophy is predicated ... on the assumption that in dynamical counterbalance of the expanding universe of entropically increasing random disorderliness, there must be a universal pattern of omnicontracting, convergent, progressive orderliness and that man is that antientropic reordering function of universe."

Human destiny is centrally bound up with the techno-scientific enterprise.

Fuller sums up poetically:

*. . . tonight vividly (as tacitly always)
God is articulating
through his universally reliable laws.
Laws pigeonholed by all of us under topics starkly "scientific"-
behavior laws graphically maintained in the performance of impersonal instruments and
mechanics
pulsing in super sensorial frequencies which may serve yellow, black
red, white, or pink with equal fidelity.
And I see conscious man alone as mechanically fallible
and progressively less reliable in personal articulation
of God's ever swifter word,
which was indeed in the beginning.
Only as mind-over-matterist, as philosopher, scientist, and informed technician
impersonally and universally preoccupied is man infallible.*

c. The Historic Challenge of Technology

If God is thought of "as a verb" for the active reordering processes of the universe, and human beings as transceiver mechanisms through which God is broadcasting," then the characteristic economic and political institutions in modern technological society can be fully understood for the first time.

Engineering is seen by Fuller as the profession at the leading edge of history, since it is the engineer who incorporates ideas into the material and social order. In his poem "Machine Tools," Fuller celebrates the creation of an airplane out of the elements of the "raw countryside" -- an anti-entropic process of ordering the scattered elements, But there is a key link in the process, which could threaten the whole cosmic enterprise: namely, the paucity of good mechanical engineers who can produce the machine tools to support the technological edifice.

*In converting one hundred tons of raw broad countryside
into five tons
of scintillating airplane-in-flight,
the machine tool is specifically that link
in the industrial chain of events...*

*Here are prepared
the mechanical surfaces between which time and energy
are masculated.*

*And here man and his wisdom
must be the master.
Yet there are few of his members qualified for such mastery.
And there creaks incisively today's weakest link.*

Fuller's own commitment was not to theory alone, despite his great respect for theory. Just as he wanted more and better engineers, he wanted the results of theory to show in industry and economics.

The individual intellect disciplinedly paces the human individual. The individual disciplinedly paces science. Science disciplinedly paces technology by opening up, both widened and refined, limits of technical, advantage generating, knowledge. Technology paces industry by progressively increasing the range and velocity inventory of technical capabilities. Industry in turn paces economics by continually altering and accelerating the total complex of environment controlling capabilities of man. Economics in turn paces the everyday evolution acceleration of man's affairs.

In political as well as economic institutions, modern scientific technology could decisively "pace" or lead the way to an unprecedented reawakening of democracy, Fuller believed. The forces of anti-democratic repression in the world could be effectively answered, as never before in history, if the technical possibilities of providing direct democratic decision making were only tapped.

*Democracy has potential within it
the satisfaction of every individual's need.
But Democracy must be structurally modernized
must be mechanically implemented
to give it a one-individual-to-another
speed and spontaneity of reaction
commensurate with the speed and scope
of broadcast news
now world-wide in seconds.*

*Through mechanical developments
of the industrial age
the cumulative production of human events
within the span of a four-year administration
is now the quantitative equivalent
of the events of a four-hundred-year
pre-industrial dynasty.*

There is likely to be a penalty imposed upon the human species if we miss this historic chance to meet our destiny by embracing fully the technological future, Fuller warns. We need to honor the engineer, stimulate the economy through disciplined scientific and technological change, and transform our political

life into a real democracy that will unlock enough free human energies to rid the world of tyrants. If we fail, then the cosmic process may go on without us. At this "unique threshold moment in history," it is not clear which way our species is going to go. In the tradition of older prophets, but with a more humorous twist at the end, Fuller speculates that if we fail in our cosmic task, God will not forever be frustrated.

*For God may reasonably be
slowly up-winding
that game of shoot-the-works
through the instrumentality of man;
or failed by man,
possibly through
some other animate specie or process
like aurora borealis
cosmic electrolysis.*

5.4. SOMBER VISIONS (I): MARTIN HEIDEGGER

The evocative thought of Martin Heidegger (1889-1976) has deeply influenced many philosophers of the twentieth century, particularly those who stress phenomenological description of the experienced structures of human existence. These concerns, sometimes called "existentialist," were already present in Heidegger's major work, *Being and Time* (1927) and were brought fully to bear on the theme of technology in Heidegger's thought-provoking essay, "The Question Concerning Technology" (1954).

A pioneering voice, Heidegger was initially interpreted by some as merely negative toward technology, yearning romantically for a by gone age of craft traditions and windmills. There is some basis for this interpretation in Heidegger's essay, as we shall see, but although Heidegger's view of the modern technological phenomenon is somber and filled with warnings, he was not simply "anti-technological." The rich complexity of his approach, especially his fascination with what can be suggested by Greek etymologies and German stems, cannot possibly be captured in a summary. Still, we must do our best since the depth of Heidegger's questioning requires careful attention.

a. The Essence of Technology

The primary "question concerning technology," Heidegger asserts, is "what it is." In a sense that question can be quickly handled, he acknowledges, by simply giving a definition blending two widely recognized aspects of technology: first, that it is an end-seeking human activity and, second, that it is the use of equipment, tools, machines, and the like, to achieve those ends. The elements of this definition are in keeping with our own, since "end-seeking" is another way of referring to the "practical" side of human affairs, and "equipment", etc., is covered by the term "implementations" in our definition of technologies as practical implementations of intelligence.

Heidegger acknowledges the "correctness" of such an "instrumental and anthropological" definition of technology. But here he makes a useful distinction between what is "'correct" and what is "true." The distinction is in some ways similar to Whitehead's warning against "'the fallacy of misplaced concreteness," that is, the tendency to confuse a significant part of a thing with the whole concrete reality from which the part has been abstracted. As Heidegger puts it:

The correct always fixes upon something pertinent in whatever is under consideration. However, in order to be correct, this fixing by no means needs to uncover the thing in question in its essence. Only at the point where such an uncovering happens does the true come to pass. For that reason the merely correct is not yet the true.

Nevertheless, the "correct" definition shows its correctness by covering the whole technological domain, both old and new. Craft technologies are means to practical ends, but so are science-led technologies like power plants and jet aircraft. Thus if we think entirely in terms of the anthropological-instrumental definition, we shall attempt to relate ourselves to modern technology as a mere means, something to be manipulated for our practical ends and kept firmly under our human mastery.

There is something wrong here, however, since in other respects modern technology is "something completely different, and therefore new." It is radically different to the extent that the modern technological phenomenon challenges nature in a way that the older technologies never did. High technology demands the extraction of energy from nature for storage and manipulation at will. Heidegger puts the contrast with the old as follows, "But does this not hold true for the old windmill as well? No. Its sails do indeed turn in the wind: they are left entirely to the wind's blowing. But the windmill does not unlock energy from the air currents in order to store it."

This qualitatively different character between modern and traditional technologies shows that the essence of technology has not really been uncovered in the "correct" definition. Something much more fundamental is at stake. Heidegger looks for help to the ancient Greek understanding of *techne*, and finds that all *techne* was primarily a "bringing-forth" and not merely the causal "bringing forth" of instrumental crafts and skills but also the creative "bringing-forth" of the fine arts as well. Plato associated *techne* with *episteme* as a kind of knowing, a being expert and at home in some area, an understanding, an opening up or revealing. Aristotle refined this concept to refer to the "bringing-forth" that occurs when such revealing does not occur naturally, as in a living organism.

Whoever builds a house or a ship or forges a sacrificial chalice reveals what is to be brought forth ... Thus what is decisive in *techne* does not lie at all in making and manipulating nor in the using of means, but rather in the aforementioned revealing. It is as revealing, and not as manufacturing, that *techne* is a bringing-forth.

b. The Technological a Priori

Certain key questions now need to be asked. Is modern technology, though a form of *techne*, a completely new phenomenon, compared to the old craft technologies with which it shares its name? If so, is it also a "revealing"? Heidegger answers that modern technology is definitely new, not only in its demands on nature but also, as we have seen, in its intimate relationship with modern science. On the one hand, modern technology is "based on modern physics as an exact science," but on the other hand, modern physics, as experimental, is dependent upon technical apparatus and upon progress in the building of apparatus.

Still, a deeper question demands answering: "Of what essence is modern technology that it happens to think of putting exact science to use?" Before there can be an attempt to manipulate and control nature by the exact laws discovered in science, there must first be the inclination to manipulate and control nature with ever greater efficiency. Here is what could be called the technological a priori, which is not itself a machine or anything overtly technological but is the "machine way of thinking" that allows nature to be approached as something to be mechanized.

This characteristically modern way of thinking and experiencing, Heidegger holds, rather than any overt techniques or artifacts, is the essence of modern technology; and this a priori framework of manipulation, control, and "setting-in-order" is what modern technology reveals. What Buckminster Fuller praised as the essence of human destiny, the "anti-entropic ordering function" of implemented intelligence, Heidegger also identifies as essential. But for Heidegger this essence belongs uniquely -- and disturbingly

-- to our era. In earlier days, the earth was cultivated, cared for, and maintained; now the earth beneath what was the peasant's field is "challenged" for its mineral deposits, which are stored and ordered, mined for our use. Suppose the mine is coal. In effect, modern technology "challenges" and stockpiles the sun's former warmth, then orders it to deliver the steam that keeps our machinery running. Or suppose that the field is left in agricultural use. Modern technology no longer allows the seed to be put "in the keeping of the forces of growth" as did farmers from earliest days until now; instead agriculture is "the mechanized food industry." Everywhere, Heidegger concludes, the essence of technology appears; the "Enframing" of the world, as a manipulable "standing reserve" for being ordered and regulated, takes place.

c. The Danger of Technology

One usually thinks about the risks and threats posed by modern technology in terms of the possibility of nuclear catastrophes or the like, but for Heidegger the main danger lies much deeper. It lies, paradoxically, in the fact that the essence of modern technology, as a way of revealing how things can be, is the revealing of some of the truth. "Being" is, at least at one level, revealed as amenable to manipulation and control. Thus modern technology cannot be dismissed and must not be underestimated, nor is it amenable to the kinds of controls we usually recommend. Too often, when we start to wonder whether modern technology is out of our control, we exhort ourselves to "'get' technology 'spiritually in hand.'" We want to "master" it. But if the technological a priori is the will to mastery itself, then our firmest determinations will merely pour fuel on the all-consuming flames of the modern technological phenomenon. The more we will to master it, the more it masters us through the technological quality of our act of willing.

Why, though, should the essence of modern technology be resisted? It is, after all, a "destining of revealing" that is given to our time as a mode of experiencing and relating to our world. Should we not simply embrace our destiny and live whole-heartedly in the technological world?

Heidegger's negative answers, though couched in terms which sometimes appear to be either aesthetic or moral, are always at bottom rooted in ontology. On the one hand, he appeals to the intuition of loss or even desecration that comes from taking everything in nature, even the mighty Rhine River, as mere "standing-reserve" for our command. He portrays a hydroelectric plant set into the Rhine. Everything is orderly, the machinery whirs and electricity for our use is produced from the turbines pushed by the current. The Rhine is now something for human disposal. It is not the same river that was spanned by the old wooden bridges. It has been changed by being dammed from a free-running flood used respectfully by boaters into "a water power supplier." Heidegger is clearly affronted by the change, calling it "monstrous." "In order that we may even remotely consider the monstrousness that reigns here, let us ponder for a moment the contrast that speaks out of the two titles, 'The Rhine' as dammed up into the power works, and 'The Rhine' as uttered out of the art work, in Holderlin's hymn by that name." Even if technological consciousness appears still to appreciate the river as landscape, it will only be as transformed into an aesthetic commodity available for purchase by tourists.

On the other hand, Heidegger worries that the tendency to approach everything as "standing-reserve" is tending to reduce human beings, like all else, to "human resources." This tendency, while serious, may have a natural limit, however, and we shall return to this later.

Ontologically, Heidegger observes that whatever sorts of objects are at stake, the very status of object itself -- something standing firmly over against us, just being what it is -- is lost by the reduction of all things to mere "standing reserve." Everything is ordered about. Nothing retains the integrity of being something with its own independence of the technological a priori. Even large shiny items we can ride in cease to be objects in this sense.

Yet an airliner that stands on the runway is surely an object. Certainly. We can represent the machine so. But then it conceals itself as to what and how it is.

Revealed, it stands on the taxi strip only as standing-reserve, inasmuch as it is ordered to ensure the possibility of transportation. For this it must be in its whole structure and in every one of its constituent parts, on call for duty, i.e., ready for takeoff.

Finally, and worst of all, Heidegger contemplates the day when the essence of modern technology, as a form of revealing that reduces human experience of every- thing that is (including human beings themselves) to "nothing but" instrumentality and resources, "drives out every other possibility of revealing."⁴⁰ Art, people, even God, would then be taken in this modality as «nothing but" elements in causal chains.⁴¹ And if this process of revealing as ordering goes too far, it will have crushed out the possibility of other modes of revealing that may offer deeper reality. "The rule of Enframing threatens man with the possibility that it could be denied to him to enter into a more original revealing and hence to experience the call of a more primal truth."

d. The Grounds for Hope

Heidegger locates the basis for "saving power," despite these profound dangers from the essence of modern technology, in the relationship between the human and the larger-than-human nature of Being. Human existence is unique in the universe for its role in the self-revelation of Being. Even when human nature is threatened by the technological a priori with being reduced to standing-reserve ("human resources," "man power," etc.), there is no fear in Heidegger that this fate -- despite our coming right to "the very brink" -- will ever finally obliterate what is distinctively human. Totter at the brink we may, but "precisely because man is challenged more originally than are the energies of nature, i.e., into the process of ordering, he never is transformed into mere standing-reserve. Since man drives technology forward, he takes part in ordering as a way of revealing."

Still, technology in its essence is not our doing alone. That is the deepest significance of the a priori character of this essence. Human beings find the technological way of thinking, they do not "make" it. For humans to be in a position even to contemplate "making" such a possibility, it would have to exist already as a possibility for thinking. This is why Heidegger insists that "modern technology as an ordering revealing is, then, no merely human doing." It "sets upon" human beings as a historical destining that is not at our voluntary disposal. Both sides of this process -- the essential human role and the essential trans-human context -- must be stressed. "Does this revealing happen somewhere beyond all human doing? No. But neither does it happen exclusively in man, or decisively through man." Likewise, the human condition, though "swayed" by its destiny, is never completely determined by it, since "that destining is never a fate that compels."

Heidegger's limited offer of hope, then, is grounded both in the special role and freedom of the human, and in the mysterious historical destining that is prior to every human response. If human beings can only somehow allow the present technological essence to reveal with enough clarity what it is, there is hope. Heidegger denies that technology is the "fate" of our age,

where "fate" means the inevitableness of an unalterable course. But when we consider the essence of technology, then we experience Enframing as a destining of revealing. In this way we are already sojourning within the open space of destining, a destining that in no way confines us to a stultified compulsion to push on blindly with technology or, what comes to the same thing, to rebel helplessly against it and curse it as the work of the devil. Quite to the contrary, when we once open ourselves expressly to the essence of technology, we find ourselves unexpectedly taken into a freeing claim.

The more we look squarely at the danger, then, the more the "saving power" is permitted to "flash" and the more primal truths may come clear to the human who is willing to "renounce human self-will" (which is, after all, only another disguise for the technological a priori that tends to block all alternative revealings of truth) and in stillness find insight into that which is.

There are no guarantees. The destinings of things cannot be "engineered" or "calculated." The hope for that sort of solution is exactly part of our problem. But neither need we abandon our machines for a primitive pre-industrial life in the Black Forest. That form of romantic anti-technological protest is too superficial for Heidegger's larger insights. No doubt the machines and techniques of an era not dominated by the essence of modern technology will be significantly different from those we now live with. To fill that out in detail would be an interesting speculation. What is important from a Heideggerian perspective, however, is that we ready ourselves to become free from the spiritual "machine" within us that stifles at the centers of human existence. If these crucial issues are squarely faced, the poet Holderlin offers the best comfort Heidegger can offer:

*But where danger is, grows
The saving power also.*

5.5. SOMBER VISIONS (2): HERBERT MARCUSE

As one of the most influential voices in the twentieth century counter-cultural movements of Europe and America, Herbert Marcuse (1898-1979) combined in his own critical perspective several elements from the visions of Marx and Fuller and Heidegger. Like Marx, Marcuse believed that industrial capitalism is radically exploitative of workers; like Fuller, he believed that technological intelligence is capable of ordering a world without poverty; and like Heidegger, he was convinced that the technological a priori rules contemporary consciousness and thereby dominates every aspect of political and social life today. In contrast to Marx, Marcuse did not believe that the proletariat, despite their oppression, are likely to rise unaided in revolt against their more sophisticated technocratic masters. In contrast to Fuller, Marcuse did not rejoice in technological progress as in itself the manifestation of human destiny, though in his view only technologically embodied solutions would satisfy the needs of the future. In contrast to Heidegger, Marcuse believed in political critique and activity against the flattening effects of "the happy consciousness."

a. Technology and the Loss of Transcendence

The central problem posed by the modern technological phenomenon, for Marcuse, is its radically engulfing nature. It is, in the root sense of the term, "totalitarian."

By virtue of the way it has organized its technological base, contemporary industrial society tends to be totalitarian. For "totalitarian" is not only a terroristic political coordination of society, but also a non-terroristic economic-technical coordination which operates through the manipulation of needs by vested interests.

The control over machinery in society is political power. That is the dominant new fact of modern civilization. The interlocking political, economic, and technical elites hold total control because society, as never before, is a "rational" system. Everything works together to maximize the smooth running of this system and its unprecedented productivity.

The common people continue to contribute the most to this productivity and to reap the least. They are, as Marx showed, systematically robbed by the system. But the development of the technological society has stolen from the common people even more than the surplus value of their production: it has stolen their awareness of being an oppressed and victimized proletariat. That, for Marcuse, is the most insidious development. "All liberation depends on the consciousness of servitude." If consciousness itself is distorted by technological rationality, then servitude itself becomes a hopelessly permanent condition.

How does technological society work this new kind of repression? The new social controls are subtle because they operate at the level of human needs themselves. Right down to basic instinctive needs, like sex, the modern technological order has fabricated a society that keeps people "happy" and docile, not even aware that they are being manipulated and controlled at every point. The mass markets provide people with the "freedom" to choose between this and that item, though not to choose to reject the wasteful consumption of products, since without such constant waste the capitalist profits would be

threatened. The centralized mass media indoctrinate even as they entertain. False needs are created by advertising -- just the "needs" that more consumption can solve, of course -- but real needs, that might dangerously lead to liberation from the meaningless round, are suffocated. Marcuse puts it bluntly:

The distinguishing feature of advanced industrial society is its effective suffocation of those needs which demand liberation -- liberation also from that which is tolerable and rewarding and comfortable -- while it sustains and absolves the destructive power and repressive function of the affluent society. Here, the social controls exact the overwhelming need for the production and consumption of waste; the need for stupefying work where it is no longer a real necessity; the need for modes of relaxation which soothe and prolong this stupefaction; the need for maintaining such deceptive liberties as free competition at administered prices, a free press which censors itself, free choice between brands and gadgets.

The root of the new technological repression lies in consciousness itself, the elimination of the chance for the Reason of Plato to function in its gadfly role. When everything present is affirmed, when everyone is "happy," then imagination itself is crippled in its power to take account of the absent, to long for what is not. Marcuse realizes that the surly refusal to "go along" with the rational society must appear neurotic, but to this there are two answers. First, this new identification of all classes with the "rational" society as a whole has been artificially manipulated. It is, Marcuse says:

the product of a sophisticated, scientific management and organization. In this process, the "inner" dimension of the mind in which opposition to the status quo can take root is whittled down. The loss of this dimension, in which the power of negative thinking -- the critical power of Reason -- is at home, is the ideological counterpart to the very material process in which advanced industrial society silences and reconciles the opposition.

Second, the "rationality" itself of the technological society is deeply irrational. It is based on programmed waste, environmental heedlessness, and constant preparation for nuclear annihilation. Even the instant sexual gratifications it offers, vicariously through its slick magazines or directly through its sanitized liberal mores, are reductive from the full sensuality of pre-technologized romance. And the individual is helpless within all this insane rationality.

Domination is transfigured into administration. The capitalist bosses and owners are losing their identity as responsible agents; they are assuming the function of bureaucrats in a corporate machine: ... Hatred and frustration are deprived of their specific target, and the technological veil conceals the reproduction of inequality and enslavement.

b. Toward the Pacification of Existence

If the totalitarianism of modern technological society is to be fought, it will first of all require the re-stimulation of the lost dimension of imagination and negative critique. The gadfly Reason of Plato will need to be released on all domains of life. Then the machine could be recaptured for the fulfillment of the human rather than vice versa. After all, Marcuse writes, "The political trend may be reversed; essentially

the power of the machine is only the stored-up and projected power of man. To the extent to which the work world is conceived of as a machine and mechanized accordingly, it becomes the potential basis of a new freedom for man."

Marcuse does not hold out a firm promise for the realization of such a potential. But it is at least not impossible if the dynamics within techno-scientific thinking are such as to lead to its own self-transcendence. Perhaps technological progress has its own dialectical rhythm. Suppose, with Fuller, that the trend toward "entropic re-ordering" and "doing more with less" is powerfully possible through human theoretical reason. And suppose, with Marx, that internal contradictions sometimes ripen and burst in surprising and revolutionary ways. Then, Marcuse speculates, once techno-scientific rationality has reached its maximum development on the practical side and has no place to go but toward the free play of art and theory, we might anticipate a qualitative revolution.

At the advanced stage of industrial civilization, scientific rationality, translated into political power, appears to be the decisive factor in the development of historical alternatives. The question then arises: does this power tend toward its own negation -- that is, toward the promotion of the "art of life"? Within the established societies, the continued application of scientific rationality would have reached a terminal point with the mechanization of all socially necessary but individually repressive labor. ... But this stage would also be the end and limit of the scientific rationality in its established structure and direction. Further progress would mean the break, the tum of quantity into quality. It would open the possibility of an essential new human reality--namely, existence in free time on the basis of fulfilled vital needs. Under such conditions, the scientific project itself would be free for trans-utilitarian ends, and free for the "art of living" beyond the necessities and luxuries of domination.

Such a forecast involves risk, since it requires that the present trends of technological society need to continue to their full completion before they can be transcended. It requires both the "can-do" technological optimism of a Fuller and the revolutionary temperament of a Marx. But if it occurs, it will create material conditions that are unprecedented in history and could allow the transformation of the world into a genuine paradise.

Marcuse insists that this cannot possibly be conceived without a base of continued high technological support. "For it is this base which has rendered possible the satisfaction of needs and the reduction of toil -- it remains the very base of all forms of human freedom." But with such a basis, the highest values of our species can be translated into technical tasks -- and accomplished. At last there could be material satisfactions without mental repression and "free development of needs on the basis of satisfaction" that would bring about a new respect for individual persons and a new tenderness toward nature. This is what Marcuse called "pacified existence," the "'tabooed and ridiculed end of technology, the repressed final cause behind the scientific enterprise."

Can this be realistically hoped for? Marcuse will not give much comfort to those who seek optimistic assurances. We are, it seems, at the beginning of the end of a period in history. "Nothing indicates," he warns, however, "that it will be a good end." The power of current repressive society is too strong to give us much confidence in its demise. The vision of pacified existence is only a chance. If the best thinking for

our situation is negative thinking, then let the gadfly sting on, "loyal to those who, without hope, have given and give their life to the Great Refusal."

Summary

This chapter has surveyed a wide range, from the Ardent Embrace of technological society to the Great Refusal. In the process we have sampled important claims and counter-claims. There are many more. Our aim has not been to exhaust or to argue with these visions but to share them, momentarily at least, and thus to see from different vantage points the many-faceted technological phenomenon.

Without alternative visions, our minds tend to be locked, without our knowing it, within narrower outlooks based on more limited experience. The assessment of a great issue needs to begin with a recognition of the spread of choices that can and must be made. Then, when our minds have been opened to the breadth of possibilities, we are better prepared for the careful process of critique.