Against the Megamachine

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> "If you want a picture of the future, imagine a boot' stamping on the human face—forever."
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> —O'Brien, in Orwell's *1984*

How do we begin to discuss something as immense as technology? To investigate it means to investigate the totality of this modern civilization, not only its massive industrial vistas which represent the structural apparatus, the stage scenery; not only the hierarchy of command and specialization which reveals the skeletal structure of this apparatus in human relations; not only "the humble objects," which "in their aggregate … have shaken our mode of living to its very roots," as Siegfried Giedion has written; but also in that internalized country of our dreams and desires, in the way we unconsciously see ourselves and our world.

What is technology? When you present this question, you confront the entire code of the modern religion, the universal fetishism of technics. The technological religion is a justification of its world and an explication of the humanity which serves it. To criticize it, to speak of going beyond it is to blaspheme against the liturgy, comparable to proposing that people live without lungs:

You cannot "get rid of technology," you cannot "destroy all machines," we are dependent upon them for our survival. In any case, technology has always been with us. A recent letter claims, for example, that when an ape pries termites out of a tree with a twig, that too, is technology. What a slippery subject, this technology which seems to be every possible manipulation of limb and tool, every form of activity! If all of-these activities are forms of technology, then there is no problem, only the misgivings of pessimists and weak-minded Luddites who would wish to break the labor-saving devices which revolutionize our way of life. Everything is changing, and yet it stays the same! And plugging into a computer is really just a different way of prying termites out of bark!

Technology is a given, there can be no questioning it. It defines our terrain and creates the terms of discourse. It is invisible because it is ubiquitous. Words and responses are shaped by it, and language is contaminated by it. Because "it has always existed," there can only be discussion of a specific style or component of technology, to be used or discarded based on the criteria of the technological religion; efficiency, velocity, compatibility with the entirety of the megamachine. Certainly, no one denies that other modes of experience were lived, and that different notions of humanity's relation to nature existed, but these modes and conceptions have been long forgotten. Hence they must have been defective, backward, underdeveloped, and eventually surpassed by progress. You can't return to the past, after all. And the past—wasn't it just another version of the present? When industrial capitalism was on the rise, the entrepreneurial spirit was seen as "man's nature," and even the indigenous world of primitives must have been another form of free market in which enterprising individuals competed for "goods and services." Robinson Crusoe was the paradigm for human nature, and where this paradigm was not dominant, as among the cannibals from whom he rescued his slave, it could be imposed. Later, as "mechanization took command," humanity was seen as the "tool user," Homo faber, reduced to a single trait, its technics, with the complex linguistic and cultural activities, the subtle signs and mythologies ignored. So ingrained was this notion of human nature, that when the cave paintings at Altamira were discovered in 1879, they were denounced as a hoax by archeologists on the

grounds that Ice Age hunters would not have had either the leisure (due to the "struggle for existence") or the mind (since sophistication is revealed only through a complex technical apparatus) to create such a graceful art. Now the commonplace is to confuse a part with the whole, to regard humanity as a sort of innate technician. This view ignores the complex rituals, languages, mimesis, the dream-work of primitives, and fixates on their technics, seeing all evolution of culture, all "advancement" as a function of revolutions in technical activities. It looks at the mineralogy, the baskets, and the stone tools of primitives as just simplified forms of cybernetics, nuclear containers, and laser cutters. Technolatry demands that everything be called by its name.

Technology Is A Way Of Life

But to identify technology simply as tools or as machines, to say that technology is all physical exertion towards creating material objects (as recent correspondents do), is to render the word incomprehensible, and to skirt the overwhelming fact that life has totally changed, that the technological apparatus has transformed human relations entirely, recreating us in its image.

By calling technology the way in which human beings do everything from picking fruit to firing missiles into space, by claiming that a society in which every sphere of human endeavor is ruled by technology is essentially the same as a society with a limited, balanced technics, this consciousness conceals the fact that technology is a way of life, a specific kind of society. This is how the technocratic consciousness functions, objectifying and amputating the world so that on one hand, technology is seen as ubiquitous and universal, and yet on the other, it is reified into an object outside of social relations, hence "neutral," quantifiable. (Which is why most discussions on technology collapse into inventories and piecemeal analyses of tools, machinery, and techniques, which is exactly because technological consciousness operates in this way.)

Just as capital has been confused with the industrial apparatus and accumulated wealth, when in reality it is more than industrial plants and wealth, but social relations, so has technology been confused with machines and tools, when it is in reality a complex of social relations, a "web of instrumentality," a qualitatively different form of domination. Technology is capital, the triumph of the inorganic; humanity separated from its tools and universally dependent upon the technological apparatus. (Critics of technology are commonly accused of being opposed to tools, when in reality it was modern technology during the mechanization of life, which destroyed tools, and in this way degraded human labor.)

It is the regimentation and mechanization of life, the universal proletarianization of humanity and the destruction of community. It is not simply machines, it is not even mechanization or regimentation alone. As Lewis Mumford pointed out in Technics and Civilization, these phenomena are not new in history; "what is new is the fact that these functions have been projected and embodied in organized forms which dominate every aspect of our existence."

Smashes Down "Every Chinese Wall"

One of the myriad activities of human beings has been the use of tools and simple machines to accomplish tasks. But until the-emergence of modern technological civilization, technics represented only a part of an organic whole. Jacques Ellul, who uses the word "technique" in a way which overlaps with the use of "technics" and "technology" in this article, and which he defines as "the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity," writes in *The Technological Society*, that at one time, "technique was applied only in certain narrow, limited areas." Even in activities we consider technical, it was not always that aspect which was uppermost in the achievement of a small economic goal, for example, the technical effort became secondary to the pleasure of gathering together … The activity of sustaining social relations and human contacts predominated over the technical scheme of things and the obligation to work, which were secondary.

"Society was free of technique," he continues. With relatively simple tools, human beings created the things around them with remarkable sensitivity and ability. "This was-a kind of technique," says Ellul, "but it had none of the characteristics of instrumental technique. Everything varied from man to man according to his gifts, whereas technique in the modern sense [in this way we separate that which constitutes tools and technics from technology which is a social order and generalized condition] seeks to eliminate such variability." Now technology is dominant, invades every domain. Whereas before, limited, diversified, local technics bore the stamp of the culture-and the individuals from which they emerged, technology now changes all local and individual conditions to its own image. It creates a single, vast, homogenous technological civilization which smashes down "every Chinese wall," creates a dispossessed, atomized and deskilled human subject which is identical from Lapland to Taiwan.

No single machine, no specific aspect of technology is responsible for this transformation. Rather, it is the "convergence on man of a plurality,-not of techniques, but of systems or complexes of techniques. The result is an operational totalitarianism; no longer is any part of man free and independent of these techniques." It will be helpful to list some of the traits of technology which Ellul calls characteristics of technique.

Characteristics of technology

First of all it is automatic, selecting the means to be employed by its own laws. It constricts choices in this way because it makes them automatic, making human intervention unnecessary and meddlesome. It "objectifies." Secondly, it is self-augmenting. In other words, it grows beyond human control by making geometric leaps. By replacing traditional methods of-doing things, and by creating whole new technology-dependent spheres of activity, it tends toward irreversibility. Once certain skills disappear, they rarely are revived. Thirdly, it is unitary, which is to say, it combines to form a whole; it is an "ensemble of practices." It is absurd to talk of technology separate from its use: "Whether the techniques involved make possible the erection of a bridge, the promotion of a new hairspray or a heart transplant, only their precise measurements differ, not their psychological force or their internal makeup," says William Kuhns, one commentator on Ellul, in *The Post-Industrial Prophets*. A process of synergism takes place in which the effects of technology are revolutionized exponentially; as Ellul says, there is a "necessary linking together of techniques," which make a whole system. One area of technology combines with another to create whole new systems at a rapid rate. The latest advancements in cybernetics, satellites and fiber optics make this description clear.

Fourth, it is universal, in that it produces the same results everywhere. Fifth, it is autonomous, "tolerates no judgment from without and accepts no limitation." It is not-neutral because it brings with it its own "method of being used." Every development in technology, even technical development which seeks to curb certain deleterious technological effects, will bring with it other unpredictable, even more disastrous effects.

Even the techniques employed to "adjust" human beings to the superhuman demands of the technological environment, the demands on the human psyche made by massification and mechanization, by the discipline of labor and the collapse of community, only serve to integrate humanity into the technological milieu and make it more subservient to machines, hence more threatened, more anxiety-ridden, more demoralized. Attempts to humanize this environment through "human techniques" such as education, amusements, commodity consumption, psychological conditioning, propaganda and medicine only serve to squander what remnants remain of our human independence, our resources and our skills.

A Depopulated World of Matter and Motion

Technology has replaced the natural landscape with the dead, suffocating surfaces of the modern Technopolis, a cemetery of "bounded horizons and reduced dimensions." Space has undergone an "inverse revolution." Time, too, since the rise in the use of the weight-driven clock, is bounded and quantified. "The clock, not the steam engine," writes Mumford in Technics and Civilization, "is the key machine of the modern industrial age … Time took on the character of an enclosed space." This quantification of knowledge and experience takes place on several levels, in

the rise of standardized weights and measures, which accompanies the rise of the centralized state; in the spread of clocks and time-keeping, in the "romanticism of numbers," which accompanies the rise of the money economy and its abstract symbols of wealth; in the new scientific methods foreseen by Galileo in confining the physical sciences to the so-called "primary qualities" of size, shape, quantity and motion; and in the methods of capitalist bookkeeping and the reduction of everything to value.

> "The power that was science and the power that was money," writes Mumford, "were, in the final analysis, the same kind of power: the power of abstraction, measurement, quantification.
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> "But the first effect of this advance in clarity and sobriety of thought," he continues, "was to devaluate every department of experience except that which lent itself to mathematical investigation … With this gain in accuracy went a deformation of experience as a whole. The instruments of science were helpless in the realm of qualities. The qualitative was reduced to the subjective: the subjective was dismissed as unreal, and the unseen and unmeasurable non-existent. What was left was the bare, depopulated world of matter and motion: a wasteland."

Swordsmiths Turn Into Factory Laborers

Although there has been controversy over whether new technologies and time-keeping spurred early capitalist mercantilism, or whether the reverse was the case, there is no reason to choose one interpretation over the other. Synergism was here in effect: technical development and capitalism went hand-in-hand, creating in their wake the technological civilization of today. This system moves by way of the mechanization and the dubious "rationalization" of all life according to normative, technical criteria, reducing the complex of human activities to a series of procedures. It isn't concerned with formal and juridical "ownership" of the apparatus, nor with the characteristics of specific machinery, nor whether particular materials are used in production. It is a combination of social regimentation and arrangement of machines, and therefore a new world outlook, a technical culture which tends towards the absolute destruction of whole communities and technics and towards the penetration of the megamachine into every aspect of life. Ellul writes, "When Andre Leroi-Gourhan tabulates the efficiency of Zulu swords and arrows in terms of the most up-to-date knowledge of weaponry, he is doing work that is obviously different from that of the swordsmith of Bechuanaland who created the form of the sword. The swordsmith's choice of form was unconscious and spontaneous; although it can now be justified by numerical calculations, such calculations had no place whatsoever in the technical operation he performed." Technology transforms this process into a more efficient, more rationalized industrial process, and all the swordsmiths into factory laborers.

It is in the factory that we see the process of mechanization at its height. Siegfried Giedion observes in *Mechanization Takes Command*, "Mechanization could not become a reality in the age of guilds. But social institutions change as soon as the orientation changes. The guilds became obsolete as soon as the rationalistic view became dominant and moved continually toward utilitarian goals. This was the predestined hour for mechanization." Murray Bookchin writes (in "Self-Management and the New Technology," *Telos* No. 41), "Of the technical changes that separate our own era-from past ones no single 'device' was more important than the least 'mechanical' of all—the factory. At the risk of casting all caution to the wind, I will aver that neither Watt's steam engine nor Bessemer's steel furnace was more significant than the simple process of rationalizing labor into an industrial engine for the production of commodities. Machinery, in the conventional sense of the term, heightened this process vastly, but the systematic rationalization of labor in ever-specialized tasks totally demolished the technical structure of self-managed societies and ultimately of workmanship, the self-hood of the economic realm … The distinction between artisan and worker hardly requires elucidation. But two significant facts stand out that turn the transformation from craft to factory into a social and characterological disaster. The first fact is the dehumanization of the worker into a mass being; the second is the worker's reduction into a hierarchical being."

Technology "Neutral"?

The notion of the "neutrality" of technology, based as it is on the refusal to admit that the massing of technology has led to a qualitative change in its character and hence in that of the environment around it, is patently ridiculous. The fact that massive technological structures would take on corresponding human structures and modes of thought and experience is self-evident. Despite his productionist leanings, Marx makes this clear when he asks (in Introduction to the Critique of Political Economy), "Are not singing and reciting and the muse necessarily put out of existence by the printer's bar; and do not necessary prerequisites of epic poetry accordingly vanish?" If the printing bar was powerful enough to retire the muse and put an end to singing and storytelling, what is to be said about the effects of the cathode ray tube, the computer, the pseudo-urbanization of the landscape, and the extreme specialization of human activity?

The automobile, for example, was seen as simply a replacement for the horse and carriage, but mass production techniques combined with Ford's new conception of mass distribution gave the automobile a significance that no one foresaw. In the case of the automobile, Ford's revolution actually came at the end of a long period of technical preparation. Mass assembly-line production and interchangeability of parts dated back to the end of the eighteenth century; by the end of the nineteenth century the process of mechanization was relatively stabilized, and produced a rise in expectations (exhibited in the popularity of the great international expositions on industry) which created the terrain for an enthusiastic reception to the automobile as an article for mass consumption. The expanding role of the state was also to play an important role, since it was only the state which would have the means to create a transportation system based on the auto. Taking the automobile as an example, who can deny that technology creates its own inertia, its own direction, its own cultural milieu? Think how the automobile has transformed our world, our thoughts, images, dreams, our forms of association, in just the span of a few generations. The automobile has uprooted our communities, undermined our farmlands, changed our very styles of eating (or contributed to changes already taking place through mechanization), redistributed our values, contaminated our sexual lives, polluted our air, both in the process of manufacture and of use, created a generalized ritual of sacrifice on the assembly line and on the road. But the automobile is only one invention of thousands. Who would have thought that within just a few years of the invention of television millions of human beings would spend more time in front of the cathode ray tube than in any other activity? Who would have thought that the world would become a radioactive nightmare, "wired for destruction," within a few years of the Manhattan Project? And what do the new "revolutionary" technologies have in store for us?

More Than the Steam Engine and the Cotton Gin

Technology transmutes our experience, of this there is no doubt. Won't it also result in undermining our very organism, rather than continually improving upon it, as it promises? John Diebold, a generally pro-technology writer, points out the impact of technology in *Man and the Computer: Technology as an Agent of Social Change*, observing that it affects "not only the means but also the ends of individual and societal actions." The Industrial Revolution was a revolution "because it created a new environment for mankind, a new way of life." It meant more than the steam engine and the cotton gin, but "a new tempo, a new outlook."

If industrial technology had the great effect that it did, the new technologies will have even wider effects, since as Diebold notes, "they deal with the stuff of which society is made—information and its communication." A recent popularization of the new technologies, The Techno/Peasant Survival Manual, an exceedingly-pro-technology book, in speaking of the new science of neuromatics, describes an electrode helmet hooked up to a microcomputer which is able to analyze and measure the activity of the human brain, "studying its electrical output in units of 500 milliseconds. With this ability to quantify human thought, the technocrats are not only learning how we think, they are in the process of challenging our very definitions of intelligence."

This lame description, which treats the same question of the quantification of thought which began with Galileo's primary qualities, displays the mystification inherent to technological consciousness. What is changing is indeed a definition, a description, a way of looking at something which the technocratic structure cannot really

comprehend without transmuting its very nature. It represents the imposition of the technology on the human mind, a procrustean bed which will "revolutionize" thinking by forcing it to conform to the parameters of the machinery. This description will reshape thought, which is always mutable and fluid, and will become "true" by force, as the railroad became more true than the buffalo, and the sheep enclosure more true than the commons.

The Diagram Group, which wrote *The Techno/Peasant Survival Manual*, knows much better than the Marxists, who still argue the neutrality of technology, what these new developments portend: "Technology is happening now," they write, "in your own life, and it will change the quality, if not the nature, of everything. Your job and your work life will not be the same. Your home will not be the same. Your thoughts will not be the same. We are talking about an increase in the rate of innovation unprecedented in human history, what some scientists are now calling spiral evolution. Says Robert Jastrow, Director of NASA's Goddard Space Institute, 'In another 15 years or so we will see the computer as the emergent form of life.'"

Over a hundred years ago, Samuel Butler expressed the same idea as satire, in his ironical utopian novel *Erewhon*, which lampooned the positivist popularization of Darwinism and the widespread belief that mechanization would usher in paradise. Butler suggested that the theory of evolution was also applicable to machines. "It appears to us that we are creating our own successors," he wrote. "We are daily adding to the beauty and delicacy of their physical organization; we are daily giving them greater power and supplying by all sorts of ingenious contrivances that self-regulating, self-acting power which will be to them what intellect has been to the human race." No longer does Butler's humor seem so humorous or far-fetched. What starts out as farce ends up as tragedy. Perhaps humanity will find itself even further reduced from being a mere appendage to the machine to being a hindrance.

The common belief of the techno-mysticism is that modern technologies, mechanization and computer communications systems diversify experience. But in reality, technology has represented a universal impoverishment and homogenization of human experience. Mechanization has narrowed our horizons by standardizing our cultures into techno-culture and by destroying all subtlety. Nowhere is this perhaps more evident (and more invisible to those who have nothing to compare with their own experiences) than in the mechanization of agriculture, one example being the cultivation of fruit trees. As Giedion points out in Mechanization Takes Command, "The influence of mechanization … leads to standardization of the fruit into few varieties … We have seen an orchard of 42,000 McIntosh trees; and the apples were so uniform that they might have been stamped out by machine." This was not always the case. He refers to a noted landscape architect of the first half of the nineteenth century who recommends 186 varieties of apple and 233 varieties of pear, and who for the keeper of a small orchard recommends thirty different kinds of apple "to ripen in succession"—names which are still relatively common in Europe where massified fruit cultivation has not taken place as it has in the U.S., where many of the varieties have become extinct. "The consumer is educated to remain content with little variety," writes Giedion. "The large red apple, which attracts the customer's eye, is especially favored, and bred less for bouquet than for a resistant skin and stamina in transit. The flavor is neutralized, deliberately, it would seem."

Reduced To Contemplating Computer Screens

The disciples of mechanization now tell us that a computerized world will make it possible for us to choose what information and products we wish to receive, that if one kind of information or commodity does not please us we can simply choose another. But this will not be much different from "changing the channel." All of the information will be identical because the technology will remake-knowledge in its own image. And the experience of using it will' be the same everywhere.

We may think that we are choosing information on tribal peoples (who no longer exist) over minute-by-minute seismological surveys of the San Andreas Fault or traffic conditions in Tokyo, or French wines over Indonesian masks, but the truth of the matter is that we will be reduced to the experience of contemplating computer screens, maintaining computer systems, feeding the monster, reducing ourselves to its terms.

What can fit into the computer, what is conducive to being transmitted by the technology, will remain—what cannot conform to its contours will vanish. That which remains will be transformed by its isolation from that which

does not, and we will be changed irrevocably in the process. A pseudo-community linked across an electronic void will take the place of traditional face to face culture; what remains will be a pulverized aggregate of units as terrifying in their isolation as they are in their sameness.

As in *1984*, language will have to be reshaped along with daily life. Certain modes of thinking, certain words and notions, will simply become atrophied and disappear, like exotic and specialized species of birds. Later generations will not miss what they never had; computerese will say everything which is necessary to say, for the domain of language and meaning will be the domain of the computer and the video screen. History will be the history which appears on the screens—all personal, idiosyncratic history will be erased.

Even "personal" and cultural history which is preserved will take on the configurations of the computer language. Anything else, any subtlety which does not fit, will be incoherent. Memory will come to resemble the computer, human beings will imitate and eventually resemble the machines that we have created. We won't be a hindrance to them, perhaps, since they will have absorbed us. Language is not "neutral" any more than information. Language is meaning and meaning represents power; to control and to shape meaning is to control and to shape the human subject.

Sinews of the Megamachine of the Future

Preposterous! say the defenders of the megamachine. Technology is not a thing which has escaped human control, it is simply something we do, and furthermore it is an activity in which we engage because we choose to do so. No one denies that choice is involved. But there are only two choices: to accept technology's terms or our own: But you anthropomorphize this thing technology! howl the technomatons. How can technology enslave us? Technology doesn't enslave people, people enslave people! This is not the place or time to discuss whether or not the technozoons which will compose the sinews of the megamachine of the future will be accurately described as human. Of course technology is not a thing outside of human interactions. It is a mutated form that these interactions have taken; future modes of domination will not take place in a vacuum. The form which they will take is now emerging.

Our total dependence on technology is the other side of our dependence on the political state. The technologies, once "interfaced" (to use their own grotesque word) with the technical-bureaucratic state, will create a qualitatively original form of domination. The nuclear-cybernetic police state will appropriate and coordinate the complex of technologies and mechanisms of social control which previously had functioned in a competitive, chaotic manner.

We are only a step away from the universal computerized identification system. South Africa has already begun to develop a system of computerized national identification and the fingerprinting of its entire population, in order "to limit as far as possible the increasing attempts to infiltrate strategic installations and national key positions with a view to espionage and/or sabotage," in the words of its Interior Minister.

In the United States, a congressional commission recently voted in favor of national identification for citizens and "legal aliens." Eugene Camps, St. Louis Chief of Police, has called for a computerized system to list "dangerous persons" in a national file to surveil "millions of people with problem backgrounds who have been allowed to move around freely and then have committed acts of violence." Many of us are already on government and corporate computers. It is only a matter of time for them to link up the various data banks into one enormous bank of information which will record every interaction we have, be it through traveling, purchases, legal problems, census, political dissidence, bank transactions, or any number of possible activities which the computer touches.

A pamphlet recently published, *The Atomic State and the People Who Have To Live In It*, which describes this process in West Germany, emphasizes, "One has to assume that the worst things we can imagine, the most paranoiac thoughts we can have only represent half of the plans the police departments really have … In particular, the incorporation of modern technology, of electronic data processing, and of computers has given a new dimension to the function of the police force.

Freedom Is Not An Absolute

But surveillance and regulation will not be necessary where there is no threat. Technology is already preparing the ground for much more pervasive forms of control than simple data files on individuals. As such forms of control as total computerization, polygraph tests, psychological conditioning, subliminal suggestion, and electronic and video eavesdropping become part of the given environment, they will come to be perceived as just as natural as superhighways and shopping centers are today. Freedom is not an absolute, ahistorical notion any more than community is. Martin Shubik, in an article which defends computerization as a protector of "democratic values" while noting its dangers, concludes, "What freedoms do we intend to preserve? Perhaps it would be more accurate to ask: What new concepts of freedom do we intend to attach the old names to?"

Eventually computer technology may have no need of the methods it employs today and which seem so advanced to us. According to Lewis M. Branscomb, Vice President and Chief Scientist of IBM, the "ultimate computer"—the "picoprocessor," a trillion times stronger than today's best microprocessor, and constructed of molecule-sized circuits—will be biological, patterned on DNA and cultivated in a petri dish. "If such a computer could be integrated with memory of comparable speed and compactness, implanted inside the skull and interfaced with the brain," write the Diagram Group authors blithely, "human beings would have more computer power than exists in the world today." Genetic engineering, cloning, integrating the human brain into cybernetic systems—is there any doubt at all that these developments will render the human being obsolete just as industrial technology undermined human community? There will no longer be any need to monitor an anarchic, unruly mass, since all the controls will be built right in from the start. It will be a world made by and for technology, a synthetic universe in which diversity and asymmetry will be suppressed, in which local and individual peculiarities will be programmed away, a self-winding terrain managed by cybernetic clones. The "irrationality" of culture, of love, of death will be conquered. The computer will lull all into an eternal, dreamless sleep.

But if technology is effective in creating directly or indirectly ever more powerful modes of domination in its wake, it is not nearly so successful when used to curb its development and the conflicts, devastations and crises which ensue. According to the technocrats, technology can be curbed and made to serve human needs through "technology assessment." "Futurist" Alvin Toffler (who has made it his particular swindle to give $200-a-head seminars for executives where he speaks on techno-planning for managers), argues that it is necessary to anticipate harmful secondary effects of technologies and prevent them from being developed. "It is, for example," he writes in typical scientific-managerial fashion, "sometimes possible to test new technology in limited areas, among limited groups, studying its secondary impacts before releasing it for diffusion." The scientistic stupidity and the technocratic authoritarianism of this statement are as obvious as its erector set methodology. But this is precisely the methodology employed by the managerial technocrats and their "consultants." Their shortsightedness at least reassures us that technology may self-destruct (taking us with it) before they can construct their Brave New World. Toffler's reification of technology into a simple system which can be used in an isolated area, at the discretion of experts and managers, fails to understand how technology spreads, how it transforms the environment, and most importantly, how it is already trapped within its own procedural inertia. It seems clear on the face of it that the new technologies appearing everywhere simultaneously could not be isolated so that their effects could be seen. It is the effects of the whole system that must be taken into account, not the laboratory effects of an isolated component.

Technology's Social Implications

Technology cannot be isolated from itself and studied with its own techniques. The laboratory experiments in a given geographical or social area performed by the huge, powerful, bureaucratic hierarchy of technicians and managers is technology and carries its social implications within it. The results of innovation will necessarily have multiple and unpredictable significance to the different sectors of the megamachine.

By its enormity and its stratification, it has already removed what were once local, traditional activities from the control of individuals and communities and made all dependent upon the apparatus. But by reducing the living activities of human beings to its procedural "rationality," it creates its own inertia and its own "laws of motion."

Giedion shows clearly in his discussion of the mechanization of bread baking how technology, by becoming trapped within its own instrumentality and centered on the hyperrationality of procedure, not only shifts an activity beyond the capacity of individuals to have control over it, but ultimately undermines the very ends that it starts out to accomplish. How did bread, which was produced locally and on a small scale, succumb to the large mechanization of the corporations, asks Giedion. But more importantly, how was it that public taste was altered regarding the nature of the "staff of life," which had changed little over the course of centuries, and which "among foodstuffs, … has always held a status bordering on the symbolic?" Mechanization began to penetrate every province of life after 1900, including the organic. Agriculture and food fell under the sway of technology. As technology demands increasing outlays and sophisticated machinery, new methods of pushing consumption, "revolutionary" forms of distribution and consumption are devised which eclipse the local baker. Massification demands uniformity, but uniformity undermines bread. "The complicated machinery of full mechanization has altered its structure and converted it into a body that is neither bread nor cake, but something half-way between the two. Whatever new enrichments can be devised, nothing can really help as long as this sweetish softness continues to haunt its structure."

How taste was adulterated, how "ancient instincts were warped," cannot be easily demonstrated. Again, what is important is not a specific moment in the transformation of techniques, or that specific forms of technology were employed, but the overall process of massification by which simple, organic activities are wrested from the community and the household and appropriated by the megamachine. But bread baking represents a part of a large cycle which begins with the planting of wheat. Mechanization invades every sector of the organic and undermines it, forever altering the structure of agriculture, of the farmer, of food. Bread is not only undermined by mechanization, the farmer is driven from the land. Giedion asks, "Does the changing farmer reflect, but more conspicuously, a process that is everywhere-at work? … Does the transformation into wandering unemployed of people who for centuries had tilled the soil correspond to what is happening in each of us?"

Technology Beyond Control

The managerial notion of "technology assessment" is comparable to attempting to stop a car careening out of control by referring to a manual concerned with its manufacture or repair. The efficiency of technology is inefficient, and its engineering is myopic and stupid. Each technical sector pursues its own ends separate from the totality. Each department of the bureaucratic machine tries to maintain its power and its influence. The very nature of the technical-bureaucratic apparatus which technology demands undermines its own planning, making it chaotic and irrational. There is never enough information to make proper decisions; the megamachine creates a social opacity which undermines its controls and its methods. A computer coughs in the Kremlin or in Washington, and millions die. Information is undermined by its own over-rationalization just as bread is negated by its own mechanization. Who can say, as Ellul has questioned, that he is truly in control of nuclear technology? Meanwhile the system speeds along at an ever faster pace.

Even defenders of technology admit that it tends to move beyond human control. One writer favorable to technology (Melvin Kranzberg, in "Technology and Human Values") attacks the "technophobia" of its critics, and centers the problem in human beings who have not learned to master the "freedoms" which technology grants. Technology is "an enabling factor, not a compulsory mechanism," according to this sanguine apologist, and the real problem is humanity's ability to "master" itself. The absurdity of this argument is obvious. Technology has given us the freedom to serve technology, the choice to act within the technological milieu. It is compulsory because it is an environment, an environment which suppresses all others. Even the question of "self-mastery" becomes problematic in the face of the changes wrought in character by technology—what will define humanity in a hundred years if technology holds sway?

R.J. Forbes, in an attack on Ellul (in *The Conquest of Nature: Technology and Its Consequences*), admits, "Even without recognizing Ellul's demon, it is possible to see a tendency in the political-technological combination to take on a gestalt of its own and to follow its own 'laws,'" and ends by concluding that we can only rely on "the inner faith of

the men who make the basic inventions." But we have relied on their "inner faith" for too long, and even their best intentions work against us.

Another writer favorable to technology, Don Fabun ("The World Alters as We Walk In It"), refers to the metaphor of the automobile speeding out of control common to the literature, arguing, "The forces of change … are amenable to our guidance. If we seem to be hurried into the future by a runaway engine, it may be that the main reason it is running away is that we have not bothered yet to learn how it works, nor to steer it in the direction we want it to go."

This statement is reminiscent of a similar one made in relation to the political process. Isaac Deutscher, in an essay on Lenin, records that at the last party congress attended by the Bolshevik leader, in April 1922, Lenin remarked "that often he had the uncanny sensation which a driver has when he suddenly becomes aware that his vehicle is not moving in the direction in which he steers it. 'Powerful forces,' he declared, 'diverted the Soviet state from its "proper road"'." Among the most powerful forces of all, of course, was the hypnosis of the authoritarian political process. Similarly, the same "powerful forces" of authoritarianism and technological optimism are in operation today. In the technological society, technology will remain in command. The "human factor" cannot be programmed into the computers as a protective measure against their power over us; it can only succumb. The "automobile" is out of control.

The Diagram Group writes in its panegyric to technological progress that "you and I … are as ignorant of how our universe is changing as fieldhands in the time of Galileo." Perhaps the odds against our finding our way out of the technological wilderness are even greater than theirs were in preventing its emergence. But we can begin by at least demolishing the myth of technology as sacred and as irrevocable. We must learn to recapture our skills, reconstitute our communities, become independent of technology. We must start to overturn all of the unquestioned presuppositions of this civilization, resist the demolition of wilderness and the universal triumph of progress, oppose the greater intervention of gadgetry and innovation in our lives, turn off the political and technological propaganda apparatus. We are proposing nothing less than the radical deconstruction of society, but this cannot come about through a political and technological program with its blueprints and its agendas, for that would be more of the same. We can only attend to first things first: and that is to begin by refusing to accept the idiom of technology, and to look at the world once more with the eyes of human beings and to articulate its promise in human terms.

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