

Retrieving the Tradition

THINKING ABOUT TECHNOLOGY¹

• George Parkin Grant •

“We have bought a package deal of far more fundamental novelness than simply a set of instruments under our control Technology is the ontology of the age.”



In each moment of our waking and sleeping, we are technological civilization. Why is it best to characterize what we are encompassing, and are encompassed by, as technological? The answer can be seen in the very structure of the word. The current use of the word “technology” in North America lays before us the particular novelty of our world.

In distinction from the usage in English of “technology” and “technologies,” the Europeans have generally used “technique” and “techniques,” the former for the whole array of means for making events happen, the latter for the particular means. They have claimed that our

¹ This text was originally published by George Parkin Grant as “Thinking about Technology,” *Technology and Justice* (University of Notre Dame Press, 1987), 11–34. Reprinted with permission.

usage confuses us by distorting the literal meaning. The word “technology” puts together the Greek word for “art” and the word for the “systematic study” of it, as the word “biology” puts together “bios” and “logos.” They claim our usage parallels a similar imprecision in English in which “history” means both the “study” and “what is studied.”

Nevertheless, although the European usage maintains verbal purity it does not evoke the modern reality as directly as ours. The very American neologism brings before us our novelty. When “technology” is used to describe the actual means of making events happen, and not simply the systematic study of these means, the word reveals to us the fact that these new events happen because we westerners willed to develop a new and unique co-penetration of the arts and sciences, a co-penetration which has never before existed. What is given in the neologism—consciously or not—is the idea that modern civilization is distinguished from all previous civilizations because our activities of knowing and making have been brought together in a way which does not allow the once-clear distinguishing of them. In fact, the coining of the word “technology” catches the novelty of that co-penetration of knowing and making. It also implies that we have brought the sciences and the arts into a new unity in our will to be masters of the earth and beyond.

The use of the word “technique” for that with which we have encompassed ourselves too easily leaves the implication that our understanding of what constitutes knowing and making is not radically different from that of previous civilizations. In fact, the modern “technique” may seem at first to suggest the same kind of meaning as what is given in the Greek “*techne*,” as if we have simply progressed in efficiency of making. We then attribute our greater efficiency to the modern scientists, who guaranteed the progress of knowledge by clarifying its sure methods, and through that objective knowledge achieved greater ability to make things happen. In this account of progressing continuity, we assume that our modern western will to be the masters of the earth was taken for granted in the “*techne*” of other civilizations. The time was not accidentally ripe; those peoples were not evolved enough to discover the sure path of science, which would have allowed them to realize that will to mastery.

With such implied “histories” of the race, we close down on the startling novelty of the modern enterprise, and hide the difficulty of thinking it. We close down on the fact that modern technology is not simply an extension of human making through the power of a perfected science, but is a new account of what it is to know and to make in which both activities are changed by their co-penetration. We hide the difficulty of thinking that novelty, because in our implied “histories” it is assumed

that we can understand the novelty only from within its own account of knowing, which has itself become a kind of making.

Indeed the English word “technology” with its Greek parts, and at the same time the novelty of what is given in their combination, shows what a transformation has taken place in our sciences, our arts and their interrelation, from what they were in our originating civilization from which the parts of the word come. It is very difficult to grasp what is given about art and science in the Greek writings, because we understand previous sciences as preparations for our own, and other accounts of nature as stumbling provisions for our objective understanding of it.

Nevertheless, at the simple surface of the question, it is clear that what was known in the physics of the Greeks was not knowledge of the kind that put the energies of nature at their disposal, as does modern western physics. It is only necessary to read Needham’s history of Chinese science to see that the same was true there. What is given in Sanskrit shows this to be equally true of the civilization founded upon the Vedanta.

When we speak of theoretical and applied science, the distinction contains something different from its ancient usage. “Applied” means literally “folded towards.” Einstein advised Roosevelt that in the light of the modern discovery of physics, atomic weapons could be built, and that the Americans should organize to build them. Physics was being “applied” not only in deciding that American interests required the making of atomic weapons, but also in the sense that the very discoveries of the science were in their essence folded towards the mastery of the energies of nature, in a way that was absent in the pre-modern sciences. That co-penetration of knowing and making has quite changed what we mean by both the arts and the sciences from what was meant by them in the pre-modern era.

Why that foldedness towards potentialities of new makings has been implicit in modern science since its origins is extremely difficult to understand, and indeed has not yet been understood. That it has been so folded is expounded with consummate clarity in such writings as those of Bacon and Descartes, as they distinguished modern science from ancient science at the time of its very beginnings. The difficulty of understanding how and why it is so folded need not lead us to doubt that the folding is a fact. It is that fact which is given us in the neologism “technology,” and the novelty of that fact declares correct the characterization of our society as technological. There may indeed be some other more perfect word to characterize our civilization, some word which will come out of the understanding of what was being revealed when the European peoples brought forth those new sciences and arts. In the meantime, the word

“technological” catches best the uniqueness of our civilization at its surface, and indicates the cause of its worldwide appeal.

In the novelties of our hourly existing, it is easy enough to recognize how much we have encompassed ourselves within technology. We sweep along super-highways to work in factories, or in the bureaucracy of some corporation; our needs are tended to in supermarkets and health complexes. We can cook, light, heat, refrigerate, be entertained at home through energy which has been produced and stored in quite new ways. If we have even a slight knowledge of the past we are aware that we can make happen what has never happened before, and we can have done to us what has never before been possible. At a higher level of attention we can recognize that our political and social decisions are interwoven with the pursuit and realization of technological ends.

It is not suggested here that the technology with which we have surrounded ourselves is of only superficial or ambiguous benefit. Modern human beings since their beginnings have been moved by the faith that the mastery of nature would lead to the overcoming of hunger and labor, disease and war on so widespread a scale that at last we could build the world-wide society of free and equal people. One must never think about technological destiny without looking squarely at the justice in those hopes. Let none of us who live in the well-cushioned west speak with an aesthetic tiredness about our “worldliness.”

Recently the more clear-sighted of our ruling classes have recognized that progress is a more complex matter than was envisaged by those who had believed that a better society would arise ineluctably from technology. In the past human beings have been responsible for the destruction of all members of some other species; but today when we watch the osprey’s glory in the ocean storm, there is not only awareness that this beauty may be passing away, because the eggs of the bird are being sterilized by our use of chemicals, but also that the source of life itself may become no longer a home of life. Our novelty lies in the fact that where Plato warned clearly against the dirtying of the waters, he did not face their pollution as a possibility in the immediate future. We are now faced with easily calculable crises (concerning population resources, pollution, etc.) which have been consequent upon the very drive to mastery itself. The political response to these interlocking emergencies has been a call for an even greater mobilization of technology, which illustrates the determining power of our technological representation of reality. More technology is needed to meet the emergencies which technology has produced.

Much of the new technology upon which we are going to depend to meet these crises in the “developed” world is technology

turned towards human beings. The new adage of rulers and educators is that to the mastery of non-human nature must now be added mastery of ourselves. The desire for “mastery of ourselves” (which generally means the mastery of other people) results in the proliferation of new arts and sciences directed towards human control, so that we can be shaped to live consonantly with the demands of mass society. These can be seen applied through the computerized bureaucracies of the private and public corporations, through mass education, medicine and the media, etc. Many scientists are now, above all, planners and central members of the ruling class. The proliferating power of the medical profession illustrates our drive to new technologies of human nature. This expanding power has generally been developed by people concerned with human betterment.

Yet nonetheless, the profession has become a chief instrument for tightening social control in the western world, as is made evident by the unity of the profession’s purpose with those of political administration and law enforcement, the complex organisation of dependent professions it has gathered around itself, its taking over of the cure of the “psyche,” and the increasing correlation of psychiatry with a behaviorally and physiologically oriented psychology. It becomes increasingly necessary to adjust the masses to behave appropriately amidst such technological crises as those of population and pollution and life in the cities.

The thinker who has most deeply pondered our technological destiny has stated that the new co-penetrated arts and sciences are now proceeding to the apogee of their determining power around the science of cybernetics. The science of the steersman comes to be present in all other sciences. Heidegger’s proposition does not mean anything as ill-thought as the statement, common a few years ago, that natural sciences and engineering are becoming dependent on the social sciences. That statement is shown to be silly by the dependence of all the social sciences (in so far as they are attempting to be modern sciences and not simply covert moralities or ideologies or a mixture of both) upon biochemistry, and of biochemistry upon physics. To put simply what is meant: the mobilization of the objective arts and sciences at their apogee comes more and more to be unified around the planning and control of human activity. What must be emphasized here is that the new technologies of both human and non-human nature have been the dominant responses to the crises caused by technology itself. This illustrates how “technology” is the pervasive mode of being in our political and social lives.

The name “technological” may indeed be a word too much on the surface for the best articulation of what is being lived and thought in the western ways which are becoming world wide. Is there some primal affirmation which is “before” technology—that is, before our science and

techniques, before our political and social ways, before our philosophies and theologies? When the “before” in that sentence is though chronologically (or, as we like to say, historically), was there some originating affirmation made somewhere and sometime when Europeans defined themselves over against the classical civilization they were inheriting? Many scholars have written of the details of the arts and sciences, the struggles and reverences of that originating time; some philosophers have attempted to who has succeeded in laying bring such a self-definition into the light of day. But who has succeeded in laying before us in a convincing unity what it was that gave the Europeans their special destiny, what primal affirmation penetrated their life and thought? Without denial of the unfathomeness of this affirmation, I would be willing to say that Europeans somehow seem to have come to an apprehension of the whole as “will.” That apprehension came to them as they tried to relate what had been given in ancient philosophy to the exclusivity which they had taken from the Bible. Yet such an attempt to understand what is “before” technology leaves one only with dim and uncertain language. As one turns back to the surface, it is adequate to call our society “technological,” because its dominant manifestation is the new co-penetrated arts and sciences.

The novelties of that destiny he before us in every lived moment. However, what exactly constitutes the novelty of these novelties is more difficult to apprehend. How novel are these novelties? When we speak of technology as a new set of occurrences in the world, what do we mean by newness in that context? What constitutes the particular newness or novelty of technology, and what is newness or novelty itself? If following the English dictionary we speak of the new as the strange and unfamiliar, how strange and unfamiliar is our technological society? What do we mean by strangeness and unfamiliarity, and how do we ever apprehend it? To descend to the practical, if we are able to apprehend correctly the particular novelty of our technological society, what does it portend for the future?

Most of us represent that novelty to ourselves as a great step forward in the systematic application of reason to the invention of instruments for our disposal. Human beings have from their beginnings developed instruments to help them get things done (indeed in our era many distinguish human beings from other animals by calling us the tool-making animals). The word “instrument” is not confined simply to external objects such as machines or drugs or hydro power, but includes such development of systems of organisation and communication as bureaucracies and factories. Technology is then thought of as the whole apparatus of instruments made by man and placed at the disposal of man

for his choice and purposes. In this account, the novelty lies in the fact that in our civilization the activity of inventing instruments reaches new levels of effectiveness because it has been systematically related to our science, and our science has at last discovered the sure path of a methodology which has allowed it progress in objective discovery.

This representation of technology as an array of instruments, lying at the free disposal of the species which creates them, seems so obviously true as to be beyond argument. Nevertheless this account of technology as instrument, however undeniable, tends to pare down the actual novelty of our situation, so that we are not allowed to contemplate that situation for what it is.

For example, a computer scientist recently made the following statement about the machines he helps to invent: "The computer does not impose on us the ways it should be used." Obviously the statement is made by someone who is aware that computers can be used for purposes of which he does not approve—for example, the tyrannous control of human beings. This is given in the word "should." He makes a statement in terms of his intimate knowledge of computers which transcends that intimacy, in that it is more than a description of any given computer or of what is technically common to all such machines. Because he wishes to state something about the possible good or evil purposes for which computers can be used, he expresses, albeit in negative form, what computers are, in a way which is more than their technical description. They are instruments, made by human skill for the purpose of achieving certain human goals. They are neutral instruments in the sense that the morality of the goals for which they are used is determined outside them.

Many people who have never seen a computer, and only slightly understand the capacity of computers, have the sense from their daily life that they are being managed by them, and have perhaps an undifferentiated fear about the potential extent of this management. This man, who knows about the invention and use of these machines, states what they are in order to put our sense of anxiety into perspective freed from the terrors of such fantasies as the myth of Doctor Frankenstein. His perspective assumes that the machines are instruments, because their capacities have been built into them by human beings, and it is human beings who operate those machines for purposes they have determined. All instruments can obviously be used for bad purposes, and the more complex the capacities of the instrument, the more complex can be its possible bad uses. But if we apprehend these machines for what they are, neutral instruments which we in our freedom are called upon to control, we are better able to come to terms rationally with their potential dangers. The first step in coping with these dangers is to see that they are related

to the potential decisions of human beings about how to use computers, not to the inherent capacities of the machines themselves. Indeed the statement about the computer gives the prevalent “liberal” view of the modern situation which is so rooted in us that it seems to be common sense itself, even rationality itself. We have certain technological capacities; it is up to us to use those capacities for decent human purposes.

Yet despite the seeming common sense of the statement, when we try to think the sentence “the computer does not impose on us the way it should be used,” it becomes clear that we are not allowing computers to appear before us for what they are. Indeed the statement (like many similar) obscures for us what computers are. To begin at the surface: the words “the computer does not impose” are concerned with the capacities of these machines, and these capacities are brought before us as if they existed in abstraction from the events which have made possible their existence. Obviously the machines have been made from a vast variety of materials, consummately fashioned by a vast apparatus of fashioners. Their existence has required generation of sustained effort by chemists, metallurgists and workers in mines and factories. Beyond these obvious facts, computers have been made within the new science and its mathematics. That science is a particular paradigm of knowledge and, as any paradigm of knowledge, is to be understood as the relation between an aspiration of human thought and the effective conditions for its realization.

It is not my purpose here to describe that paradigm in detail; nor would it be within my ability to show its interrelation with mathematics conceived as algebra. Suffice it to say that what is given in the modern use of the word “science” is the project of reason to gain “objective” knowledge. And modern “reason” is the summoning of anything before a subject and putting it to the question, so that it give us its reasons for being the way it is as an object. A paradigm of knowledge is not something reserved for scientists and scholars. Anybody who is awake in any part of our educational system knows that this paradigm of knowledge stamps the institutions of that system, their curricula, in their very heart, in what the young are required to know and to be able to do if they are to be called “qualified.” That paradigm of knowledge is central to our civilizational destiny and has made possible the existence of computers. I mean by “civilizational destiny” above all the fundamental presuppositions that the majority of human beings inherit in a civilization, and which are so taken for granted as the way things are that they are given an almost absolute status. To describe a destiny is not to judge it. It may indeed be, as many believe, that the development of that paradigm is a great step in the ascent of man, that it is the essence of human liberation, even that its

development justifies the human experiment itself. Whatever the truth of these beliefs, the only point here is that without this destiny computers would not exist. And like all destinies, they “impose.”

What has been said about the computer’s existence depending upon the paradigm of knowledge is of course equally true of the earlier machines of industrialism. The western paradigm of knowledge has not been static, but has been realized in a dynamic unfolding, and one aspect of that realization has been a great extension of what is given in the conception of “machine.” We all know that computers are machines for the transmitting of information not the transformation of energy. They require software as well as hardware. They have required the development of mathematics as algebra, and of algebra as almost identical with logic. Their existence has required a fuller realization of the western paradigm of knowledge beyond its origins, in this context the extension of the conception of machine. It may well be said that where the steel press may be taken as the image of Newtonian physics and mathematics, the computer can be taken as the image of contemporary physics and mathematics. Yet in making that distinction, it must also be said that contemporary science and Newtonian science are equally moments in the realization of the same paradigm.

The phrase “the computer does not impose” misleads, because it abstracts the computer from the destiny that was required for its making. Common sense may tell us that the computer is an instrument, but it is an instrument from within the destiny which *does* “impose” itself upon us, and therefore the computer *does* impose.

To go further: How are we being asked to take the word “ways” in the assertion that “the computer does not impose the ways”? Even if the purposes for which the computer’s capacities should be used are determined outside itself, do not these capacities limit the kind of ways for which it can be used? To take a simple example from the modern institutions of learning and training: in most jurisdictions there are cards on which children are assessed as to their “skills” and “behavior,” and this information is retained by computers. It may be granted that such information adds little to the homogenizing vision inculcated throughout society by such means as centrally controlled curricula or teacher training. It may also be granted that as computers and their programming become more sophisticated the information stored therein may be able to take more account of differences. Nevertheless, it is clear that the ways that computers can be used for storing and transmitting information can only be ways that increase the tempo of the homogenizing processes. Abstracting facts so that they can be stored as information is achieved by classification, and it is the very nature of any classifying to homogenize.

Where classification rules, identities and differences can appear only in its terms. Indeed the word “information” is itself perfectly attuned to the account of knowledge which is homogenizing in its very nature. “Information” is about objects, and comes forth as part of that science which summons objects to give us their reasons.

It is not my purpose at this point to discuss the complex issues of good and evil involved in the modern movement towards homogeneity, nor to discuss the good of heterogeneity, which in its most profound past form was an expression of autochthony. Some modern thinkers state that beyond the rootlessness characteristic of the present early stages of technological society, human beings are now called to new ways of being rooted which will have passed through modern rootlessness, and will be able at one and the same time to accept the benefits of modern homogenization while living out a new form of heterogeneity. These statements are not at issue here. Rather my purpose is to point out that the sentence about computers hides the fact that their ways are always homogenizing. Because this is a hidden, questioning homogenization is closed down in the sentence.

To illustrate the matter from another aspect of technological development: Canadians wanted the most efficient car for geographic circumstances and social purposes similar to those of the people who first developed the mass-produced automobile. Our desire for and use of such cars has been a central cause of our political and economic integration and our social homogenization with the people of the imperial heartland. This was not only because of the vast corporate structures necessary for building and keeping in motion such automobiles, and the direct and indirect political power of such corporations, but also because any society with such vehicles tends to become like any other society with the same. Seventy-five years ago somebody might have said “The automobile does not impose on us the ways it should be used,” and who would have quarreled with that? Yet this would have been a deluded representation of the automobile.

Obviously, human beings may still be able to control, by strict administrative measures, the ways that cars are used. They may prevent the pollution of the atmosphere or prevent freeways from destroying central city life. It is to be hoped that cities such as Toronto will maintain themselves as communities by winning popular victories over expressways and airports. Whatever efforts may be made, they will not allow us to represent the automobile to ourselves as a neutral instrument.

Obviously the “ways” that automobiles and computers can be used are dependent on their being investment-heavy machines which require large institutions for their production. The potential size of such

corporations can be imagined in the statement of a reliable economist: if the present growth of I.B.M. is extrapolated, that corporation will in the next thirty years be a larger unit than the economy of any presently constituted national state, including that of its homeland. At the simplest factual level, computers can be built only in societies in which there are large corporations. This will be the case whatever ways these institutions are related to the states in which they are incorporated, be that relation some form of capitalism or some form of socialism. Also those machines have been and will continue to be instruments with effect beyond the confines of particular nation states. They will be the instruments of the imperialism of certain communities towards other communities. They are instruments in the struggle between competing empires, as the present desire of the Soviet Union for American computers illustrates. It might be that "in the long run of progress," humanity will come to the universal and homogenous state in which individual empires and nations have disappeared. That in itself would be an even larger corporation. To express the obvious: whatever conceivable political and economic alternatives there may be, computers can only exist in societies in which there are large corporate institutions. The ways they can be used are limited to those situation. In this sense computers are not neutral instruments, but instruments which exclude certain forms of community and permit others.

In our era, many believe that the great question about technology is whether the ways it is used will be determined by the standards of justice in one or other of the dominant political philosophies. The rationalism of the west has produced not only modern physical science, but also modern political philosophy. Technology is considered neutral, and its just use will depend upon the victory of true rather than false political philosophy. The appeal of the teachings of political philosophers has been massive in our era, because these teachings have taken the form of ideologies which convince the minds of masses of human beings. The way that computers should be used can be solved satisfactorily if political regimes are shaped by the true philosophy. The three dominant alternatives are capitalist liberalism, communist Marxism, and national socialist historicism.

What calls out for recognition here is that the same account of reason which produced the technologies also produced the accounts of justice given in these modern political philosophies. It led, moreover, to the public manifestation of those political philosophies as ideologies. The statement "the computer does not impose on us the ways it should be used" abstracts from the fact that "the ways" that the computer will be used will be determined by politics in the broadest sense of that term.

Politics in our era are dominated by accounts of society which came forth from the same account of reasoning that produced the new co-penetrated arts and sciences.

It cannot be my purpose at this point to show the nature of that sameness. Such a demonstration would require a detailed history of the modern west. It would require above all a demonstration of the mutual interdependence of the modern physical sciences and the modern moral sciences as they were both defined against the account of science in classical philosophy. Much of the enormous enterprise of modern scholarship has been taken up with the detailed mapping of what was done and thought and made by large numbers of inventors, scientists, artists, philosophers, politicians, religious reformers, etc. Beyond scholarship, the demonstration of this interdependence would require the ability to think what was being thought by the greatest scientists and philosophers. By distinguishing the new science from the account of science in the ancient world they laid down the modern affirmations concerning what is. Concerning the conception of justice, it would be necessary to follow how great philosophers such as Descartes and Locke, Rousseau and Nietzsche, understood the unity between the findings of modern science and their accounts of justice.

Without attempting any of these demonstrations, suffice it to state that the ways that computers have been and will be used cannot be detached from modern conceptions of justice, and that these conceptions of justice come forth from the very account of reasoning which led to the building of computers. This is not to say anything here concerning the truth or falsity of modern conceptions of justice, nor is it to prejudge the computer by some reactionary account stemming from the desire to turn one's back on the modern. It is simply to assert that we are not in the position where computers lie before us as neutral instruments, and where we use them according to standards of justice which are reached outside of the existence of the computers themselves. The instruments and the standards of justice are bound together, both belonging to the same destiny of modern reason. The failure to recognize this hides from us the truth about the "ways" computers can be used.

The force of that destiny is to be seen, finally, in the ambiguity of the word "should" in the statement, "The computer does not impose on us the ways it should be used." Our novel situation is presented as if human beings "should" use computers for certain purposes and not for others. But what has the word "should" come to mean in advanced technological societies?

"Should" was originally the past tense of "shall." It is still sometimes used in a conditional sense to express greater uncertainty about

the future than the prophetic sense of “shall.” (“I shall get a raise this year” is more certain than “I should get a raise this year.” The colloquialism from the home of our language, “I shouldn’t wonder,” expresses this.) In its origins, “shall” was concerned with “owing,” when used as a transitive verb. Chaucer wrote: “And by that feyth I shal to god and yow.” But over the centuries “should” took over from “shall” as the word with the connotation of owing, and could be used for that purpose intransitively.

The sentence “The computer does not impose on us the ways it should be used” is concerned with human actions which are owed. If the statement were in positive form—“The computer does impose on us the ways it should be used”—the debt would probably be understood as owed by human beings to machines. We can say of a good car that we owe it to the car to lubricate it properly. We would mean it in the same sense if we were to say we owe it to ourselves to try not to contradict ourselves, if we wish to think out some matter clearly. If we want the car to do what it is fitted for—which is, in traditional usage, its good—then we must look after it. But the “should” in the statement about the computer is clearly not being used about what is owed by men to machines. The sentence is concerned with the just use of the machine as instrument. “Should” expresses that we ought to use it justly. But what is the nature of the debt there spoken? To what or to whom do we owe it? Is that debt conditional? For example, if human beings “should” use computers only in ways that are compatible with constitutional government, and not to promote tyranny, to what or to whom is this support of constitutional government owed? To ourselves? to other human beings? all, or some of them? to nature? to history? to reasonableness? to God?

Because of the ambiguity which has fallen upon all accounts of owing, our era has often been described as a time of nihilism. As many Europeans came to believe over the last three hundred years that their affirmations about goodness could not find foundations in accounts of God or nature, reason or history, the result for many has been a state of mind which is well described as nihilism. This state of mind has had wide public influence because the mass literacy necessary to technological society made nihilism a situation open not only to the few. In North America the organisation of training in schools and multiversities has produced mass “wised-upness,” which is the democratic edition of nihilism.

Nevertheless it is necessary to be careful at this point. Characterizing technological society as essentially nihilistic prejudices the whole question of what it is. Such a dismayed reaction is as likely to close

down thought about its nature as much as does any progressivism. If we use the word “good” in the simplest way as what we approve, and “bad” as what we deplore, is it not evident that large majorities now give their shared approval to certain activities and that from those activities we can apprehend a positive modern conception of goodness? For example, is it not generally believed that freedom for sexual realization in its varying particularities should be promoted in societies? Or, if one has any knowledge of the modern scientific community, is one not aware of the positive expectations about its accomplishments which permeate that community, from which a positive conception of goodness can be deduced?

A description of the modern era fairer than that of nihilism is that a great change has taken place in the public conceiving of goodness. The enunciation of that change is best made in terms of what is positive in both the past and the prevalently modern accounts. The originating western conception of goodness is of that which meets us with the overriding claim of justice, and persuades us that in desiring obedience to that claim we will find what we are fitted for. The modern conception of goodness is of our free creating of richness and greatness of life and all that is advantageous thereto. The presently popular phrase in the modern account is “quality of life.”

The modern conception of goodness does not include the assertion of a claim upon us which properly orders our desires in terms of owing, and which is itself the route and fulfilment for desire. In the prevalent modern view, owing is always provisional upon what we desire to create. Obviously we live in the presence of the existence of others, and our creating may perforce be limited because of what is currently permitted legally to be done to others. However the limitations put upon creating by the claims of others, whether nationally or internationally, are understood as contractual: that is, provisional. This exclusion of non-provisory owing from our interpretation of desire means that what is summoned up by the word “should” is no longer what was summoned up among our ancestors. What moderns hear always includes an “if”: it is never “beyond all bargains and without an alternative.” Moreover, the arrival in the world of this changed interpretation of goodness is interrelated to the arrival of technological civilization. The liberation of human desiring from any supposed excluding claim, so that it is believed we freely create values, is a face of the same liberation in which men overcame chance by technology—the liberty to make happen what we want to make happen. We are free, not only in what we want to make happen, but also in choosing the means. The whole of nature becomes

more and more at our disposal as if it were nothing in itself but only our “raw material.”

“The computer does not impose on us the ways it *should* be used” asserts the essence of the modern view, which is that human ability freely determines what happens. It then puts that freedom in the service of the very “should” which that same modern novelty has made provisional. The resolute mastery to which we are summoned in “does not impose” is the very source of difficulty in apprehending goodness as “should.” Therefore, the “should” in the statement has only a masquerading resonance in the actions we are summoned to concerning computers. It is a word carried over from the past to be used in a present which is ours only because the assumptions of that past were criticized out of public existence. The statement therefore cushions us from the full impact of the novelties it asks us to consider. It pads us against wondering about the disappearance of “should” in its ancient resonance, and what this disappearance may portend for the future.

I have written at length about this statement to illustrate how difficult it is to apprehend correctly the novelness of our novelties. When we represent technology to ourselves as an array of neutral instruments, invented by human beings and under human control, we are expressing a kind of common sense, but it is a common sense from within the very technology we are attempting to represent. The novelness of our novelties is being minimized. We are led to forget that modern destiny permeates our representations of the world and ourselves. The coming to be of technology has required changes in what we think is good, what we think good is, how we conceive sanity and madness, justice and injustice, rationality and irrationality, beauty and ugliness.

Indeed there is novelty in how we now conceive novelness itself. That changed conception of novelness also obviously entails a change in the traditional account of an openness to the whole, and therefore a quite new content to the word “philosophy.” A road or a sparrow, a child or the passing of time come to us through that destiny. To put the matter crudely: when we represent technology to ourselves through its own common sense we think of ourselves as picking and choosing in a supermarket, rather than within the analogy of the package deal. We have bought a package deal of far more fundamental novelness than simply a set of instruments under our control. It is a destiny which enfolds us in its own conceptions of instrumentality, neutrality and purposiveness. It is in this sense that it has been truthfully said; technology is the ontology of the age. Western peoples (and perhaps soon all peoples) take themselves as subject confronting otherness as objects—objects lying as raw material at the disposal of knowing and making subjects. Unless we comprehend the

package deal we obscure from ourselves the central difficulty in our present destiny: we apprehend our destiny by forms of thought which are themselves the very core of that destiny.

The result of this is that when we are deliberating in any practical situation our judgement acts rather like a mirror, which throws back the very metaphysic of the technology which we are supposed to be deliberating about in detail. The outcome is almost inevitably a decision for further technological development. For example, we can see this in the recent public discussions concerning research into the recombinations made possible by the discovery of the structure of DNA. The victory of those espousing the development of such research was not based simply on the power of the community of scientists to guarantee their freedom under the banner of Robert Oppenheimer's *bon mot* about experiment: "when you see something that is technically sweet, you go ahead and do it." It was rather that those (both inside and outside the scientific community) who were troubled about the possibilities in such research could not pass beyond the language of immediate dangers in expressing their concern. Once the scientists showed how the immediate threats could be met, the case was closed. The opponents of the research could not pass beyond the language of specifiable dangers, because any possible long range intimations of deprivation of human good could not be expressed in the ontology they shared with their opponents. The ontology expressed in such terms as "the ascent of life," "human beings making their own future," "the progress of knowledge," or "the necessity of interfering with nature for human good" could not be used against itself. But there is not other language available which does not seem to be the irrational refusal of the truths of scientific discovery.

Any deliberate "no" to particular researches requires thinking the truth of the distinction made in the old adage *a posse ad esse non valet consequentia* (I take this to mean: just because something can be, it does not follow that it should be). But the account of existence which arises from the modern co-penetration of knowing and making exalts the possible above what is. It has undermined our ability to think that there could be knowledge of what is in terms of which the justice of every possible action could be judged in advance of any possible future. It is not feasible here (and who indeed is capable of that task?) to spell out in detail how in and through modern science and philosophy, or even in and through the poor remnants of theology (which may be called German theology), the possible is exalted above what is. However, the matter can be put simply: if we hold in our minds the two statements, *A posse ad esse non valet consequentia* and "When you see something that is technically sweet you go ahead and do it," and when you argue about what to do

about it only after you have had your technical success—then is there any doubt which statement is congruent with the sense of our own creativity as knowers and makers?

Consequently, for those who affirm that the justice or injustice of some actions can be known in advance of the necessities of time and of the calculation of means, there is a pressing need to understand our technological destiny from principles more comprehensive than its own. This need lifts us up to ask about the great western experiment in a more than piecemeal way. It pushes us to try to understand its meaning in terms of some openness to the whole which is not simply sustenance for the further realization of that experiment. But the exigency of our need for understanding must not blind us to the tightening circle in which we find ourselves. We are called to understand technological civilization just when its very realization has radically put in question the possibility that there could be any such understanding. □

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