traditional office of pastor and replace that single person with a group of persons or team. The canon distinguishes two basic possibilities: (1) the pastoral care of a parish (or multiple parishes) is entrusted to a group of priests *in solidum* (as equals) or (2) participation in the pastoral care of a parish is entrusted to one or more non-priests. In the first situation, according to canon 517, one of the priests of the team is named moderator of the group, directs its activities and represents the team before the bishop. However, despite this designation, all priests on the team bear the responsibilities ordinarily assigned to the pastor equally, while fulfilling them under the direction of the moderator (cc. 543, 544). The team must work out for itself how the various responsibilities which each member bears will be executed. The framers of the 1983 Code acknowledged that this arrangement, although not foreseen in the documents of Vatican II and clearly an exception, could be useful ''in certain circumstances.'' The canon, repeating that phrase, does not indicate what any of circumstances might be. Rather, implementation of this configuration of team ministry is left to the judgment of each diocesan bishop.

The second situation of team ministry, as stipulated in c. 517 § 2, is to be implemented only when there is a lack of priests. Under those circumstances, the diocesan bishop may entrust participation in pastoral care to ''a deacon, to another person who is not a priest, or to a community of persons.'' The word ''participate'' with reference to pastoral care is used designedly in the canon to distinguish between ''full'' pastoral care, which includes celebration of the sacraments, and the portion of pastoral care which can be made available by those who are not priests.

In this instance of team ministry, again, the parish does not have a pastor, but a priest is assigned to direct pastoral care. For such parishes, the team is composed of the priest-director and whatever persons have been entrusted with participation in pastoral care by the diocesan bishop. The team must work out for itself how its responsibilities will be carried out, how and when the priest-director will be available to the parish, whether there might be another priest to provide sacramental services, and what functions will be carried out by the non-priests. Establishment of this form of team ministry calls for careful preparation of the parish community both to accept an increased role of leadership from laity or deacons and a diminished role of presence, if not leadership, from the ordained. Official documents issued by the Holy See, especially ''Directory for Sunday Celebrations in the Absence of a Priest'' issued in 1988 have highlighted these concerns.

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[E. RINERE]

TECHNOLOGY, PHILOSOPHY OF

According to the authoritative bibliography of the philosophy of technology of C. Mitcham and R. Mackey, in the late 20th century there were at least seven separate and distinct meanings for the phrase ''philosophy of technology.'' It can mean (1) ethical and/or political critiques of technology, (2) religious critiques, (3) treatments of technology from the specialized perspectives of phenomenology or existentialism aimed at discerning the ''pure essence'' or the ''existential meaning'' of technology, (4) metaphysical analyses attempting to situate the phenomenon of technology in a larger speculative context other than the religious or phenomenological, (5) studies based on the techniques of linguistic analysis focusing on the meaning and uses of the term ''technology'' or related terms or of common statements in which the terms appear, (6) the commonsense ''philosophy'' of practicing engineers, applied scientists, and science managers (including the history and sociology thereof), and (7) what Mitcham and Mackey call ''comprehensive philosophies of technology,'' i.e., studies that combine two or more of the above approaches in an attempt to produce a philosophical synthesis of the meaning of technology as a phenomenon distinct, but not necessarily separable, from any other subject of philosophical inquiry.

Before selecting one of these meanings as a focus here, a further clarification is needed—namely, of the word ''technology'' itself. Jacques ELLUL, an internationally respected philosopher of technology, prefers the term ''technique'' and defines it so broadly that it includes any means-to-end rational organization of behavior, whether or not it uses or depends upon machines, computers, or scientific or technical knowledge of any sort. ''Technique'' in this broad sense Ellul takes to be the spirit or *Zeitgeist* of contemporary Western civilization. And he takes this ''spirit of technique'' to be an enslaving force from which he doubts that man will be able to free himself.

The difficulty with sweeping assertions of this sort is that they are almost impossible to deal with except as metaphor. Their acceptance or rejection depends not upon evidence but upon the persuasiveness of an image.

Consequently, one does not need to claim that he can give a perfectly objective definition of the term ''technol-

ogy'' in order to reject Ellul's in favor of a more restrictive definition. What seems to be the common denominator in most treatments of technology is the association of the two terms ''science'' and ''technology.'' While some purists argue for a clear distinction between the two, both in the popular mind and in most broad-based treatments of technology there is an explicit assumption that modern technology is essentially related to science. Whether or not adequate distinctions can be made between pure science, applied science, and technology, or between a theoretically oriented science and a goal- or mission-oriented technology, the assumption is made here that in an adequate definition of technology one component must be its essential dependence on scientific knowledge.

A second common denominator in most treatments broad enough to be called philosophies of technology is the recognition that a definite social group is the carrier of technology—or at least of technological knowledge (where this is separated from the economic or political uses of technology). This carrier is generally referred to in the literature as the ''technical community'' and is usually taken to include a large number of scientists, nearly all engineers and technicians, and research managers in government or industry or specialized research institutes.

The term ''technology,'' then, can be taken to cover this scientific and technical community, including its inner structure and functions, its relationships to other social phenomena, its products, its particular values, and its implicit view of human nature. The term ''philosophy of technology'' will then mean a set of generalizations or a systematic treatment, in philosophical language, of one or another or all of the above aspects of this social phenomenon.

What validity there is in evaluations of technological society as a whole, or in assessments of the place of technology in the larger culture, is a questionable matter. Can such claims be meaningfully verified or falsified? It might be claimed by one or another critic or defender of technology that his view is objective, that he is simply reporting the facts as they are. As a counterclaim to this it would be too strong to say that all theories about technological society, like all large-scale social theories, must necessarily be moralistic or politically or ideologically biased in some way; it is enough to say that there is usually a direct correlation between an author's view of man in society—including his view of man in technological society—and his personal philosophy, his moral and political attitudes, and his concept of the nature of man. This means that for all practical purposes every proponent of a philosophy of technology is simply presenting his particular version of what a good technological society would be like or his view as to what is wrong with technological society as he sees it. Ideally, then, ''philosophy of technology'' ought to stand for an open forum in which various interpretations of technology and technological society are openly debated.

The range of interpretations of technology is broad. Only a limited sampling can be given here.

Marcuse, Skinner, and Mumford. One of the best-known critics of capitalist technology, or of its misuse in socialist countries, is the social philosopher Herbert Marcuse. His fundamental thesis—which has not varied greatly even when Marcuse has modified its expression in response to changing circumstances in the United States—is that technology is a tool in the hands of the ruling class helping to guarantee the enslavement of the masses by its totally alienating rational objectivity. According to Marcuse ''the prevailing forms of social control are technological''; they appear rational ''to such an extent that all contradiction seems irrational and all counteraction impossible.'' Marcuse feels that men in a technological society have reached an unprecedented level of alienation, an entirely objective alienation. The alienated individual ''is swallowed up by [his] alienated existence. There is only one dimension [the technological], and it is everywhere and in all forms'' (*One-Dimensional Man* 9, 11). Marcuse's analysis shows an obvious dependence on Marx, but he has also been influenced by Freud and betrays a stronger belief than Marx in a ''higher culture,'' which he sees as disappearing more each day in technological society.

Less pessimistic than Marcuse's is the popular philosophy of technology of B. F. Skinner. While Skinner also claims to have a place in his technological utopia for culture, his emphasis is primarily on technology. He argues for a wholesale and deliberate adoption of what he calls the ''technology of behavior,'' by which he means the adaptation of the techniques of laboratory conditioning to the purposes of social and political engineering. He feels that the process can remain democratic and is perfectly feasible; in fact he argues that it is necessary if mankind is to solve such social problems as overpopulation, war, and crime. The price for the elimination of these evils is to go ''beyond freedom and dignity,'' i.e., to consciously give up what Skinner takes to be the illusions of freedom and dignity. Man must admit that he is totally conditioned by his environment and make the best of it. Skinner often sounds optimistic about his technological utopia.

Another pessimistic philosophy of technology—one with an entirely different slant from that of Marcuse—is that of the historian and social commentator Lewis Mumford. Going back into history for his sources, Mumford

claims that he has discovered a recurring ''myth of the machine'' in accord with which powerful rulers are willing to organize their subjects into vast machine-like organizations for the efficient attainment of their goals. The most striking analogy of this sort that Mumford uses is between the organization of manpower for the building of the pyramids and the organization of technical experts needed to get men to the Moon. Mumford's overall thesis is that such organization is usually turned toward the achievement of victory in war, and the other major image he uses to describe the dangers inherent in contemporary technology is the ''pentagon of power.'' Though his expression of the view is infinitely superior in style and erudition, Mumford thus has some affinity with critics of the so-called military-industrial complex.

Ellul, Marcel, Heidegger, and Dessauer. The last of these very general critiques of technological society as a whole to be taken up here can be lumped under the inexact but common heading of existentialism and phenomenology. Without intending to categorize him in any way that he would find reprehensible, one can say that Jacques Ellul probably fits best in this group of critics of technology. In any case much of the audience for his works in the United States has been among readers sympathetic with an existential anxiety about man's future in a technological world. Since Ellul's views have already been summarized briefly, it may be enough to relate them here to the thought of Gabriel MARCEL, the most outspoken critic of technological culture among those usually lumped under an existentialist label. Marcel, even in his most balanced essays, sees technological civilization as embodying what is worst in modern culture. Both he and Ellul share the view that only something such as divine grace can save modern man from the evil grip of technology.

Martin HEIDEGGER is another influential philosopher who is existentially pessimistic about technology. Heidegger's view of technology naturally borrows a great deal from his general philosophy of the ''concealment'' of Being in a multitude of beings. One path to the unconcealing of Being turns out to be an appropriate existential understanding of technology. Regrettably, in Heidegger's view, most technologists, technocrats, and ordinary users of the products of technology focus on technological products rather than on the meaning of Being that ought to infuse every aspect of existence. While this analysis might seem to lead to a hope that men in a technological society might come to realize that technology can be a path to Being, recognizing technology's internal self-limiting features when it is seen in this light, Heidegger is pessimistic about this ever happening.

On the other hand, the leading phenomenological philosopher of technology (though here the term ''phenomenology'' has more in common with Hegel than with those who are usually called phenomenologists today), Friedrich Dessauer, has a completely optimistic view of technology, seeing it as the transforming force in a totally new philosophy of culture appropriate to the contemporary world. Dessauer, who was little known in the United States until his work received a boost from Mitcham and Mackey, is a disciple of Kant who claims to have found in technology the means both to resurrect Kant and to move his critical philosophy onto a higher metaphysical ground. Briefly, Dessauer argues that technical invention, wherein the inventor finds himself drawn irresistibly toward a perfect solution to his technical problem (which is supposed to explain the discovery-like ''That's it!'' that often accompanies the solution of a technical problem), reveals the existence of a world of ''ideal forms'' that allows man to reach the knowledge of ''the thing in itself'' that Kant could never reach. Dessauer calls the knowledge of technology ''the fourth realm,'' beyond Kant's three realms of natural science, ethics, and aesthetics, and he sees it as the new foundation of a comprehensive metaphysics. This leaves philosophy of technology as the foundational discipline of an adequate contemporary philosophy and seems to leave the technologist aware of the meaning of his pursuit with an unlimited challenge for his God-like creative talents.

Futurology, and the Two Cultures. Aside from these very broad assessments of technological society, two other types of treatments of technology—''futurism'' or ''futurology'' and discussions of the so-called two-cultures controversy—while specialized are general enough in their implications to bear on philosophy of technology.

Futurology, in current usage, stands for science-based social planning for the future. Some of the best-known futurists include Bertrand de Jouvenel and his Futuribles group; Daniel Bell, the editor of the influential *Toward the Year 2000;* and Herman Kahn and Anthony Wiener, whose *The Year 2000: A Framework for Speculation on the Next 33 Years* achieved best-seller status in spite of its technical jargon and incomplete scenarios of the future. William Ewald has expressed the essence of what is distinctive about scientific futurology: ''We now [with the computer] have the capacity to study seriously the real-life multivariable complex interrelationships of the environment which the human mind could not possibly manage unaided'' (*Environment for Man: The Next Fifty Years,* 5). Employing computer-projected probabilities, the futurists believe that they can help mankind design an optimum environment for the future. They can do so because their probabilistic computer-based scenarios of the future—while they cannot predict the future absolutely any more than could earlier prophecies of the fu-

ture—can make social engineering a scientific enterprise. If true, this would be a significant breakthrough, and ''technological man'' would turn out to have an awesome control of the future unshared by any previous culture. Not all, however, are agreed that the computer is so powerful, or that social engineering is any more palatable in this than in any other form.

The 1960s controversy triggered by C. P. Snow's *The Two Cultures* is also relevant to philosophy of technology. Although critics retorted that neither the scientific nor the humanistic community is unified enough to be called a culture, Snow seems to have put his finger on a real split in technological culture. In a world of high specialization, few scientists or engineers can lay claim to any greater degree of humanistic sophistication than an amateur interest in poetry or music or perhaps politics; nor can the average academic humanist usually claim that he even attempts to keep up with scientific knowledge. This split, whatever its explanation or prospects for healing, says something profound about technological society. A philosophy of technology, whether it attempts to explain or to solve the problem, must in some way come to grips with it.

It is in this context that some Catholic writers have turned to the thought of Pierre TEILHARD DE CHARDIN. His vision of the future convergence of science and religion has seemed to them to offer a way out for contemporary man. Others, however, see Teilhard de Chardin as distorting science and demeaning religion; they feel that a philosophical synthesis adequate for a scientific or technological age is yet to be discovered.

Finally, among these interpretations of technology, there seems to be no end to popularized ''philosophies of technology.'' The late 1960s and early 1970s in particular witnessed a flood of publications of this sort. Some of the most popular authors included Charles Reich, Theodore Roszak, Alvin Toffler, and, a little earlier, Marshall McLuhan. How many of their works will turn out to be ephemeral and how many will contribute to a serious philosophy of technology remains of course to be seen. No serious student of the history and philosophy of technology, however, can afford not to keep up with the popular literature. It reflects an aspect of technology—its acceptance in the popular mind—that must be included in some fashion in any comprehensive treatment of the issue. The same is also true of science fiction.

See Also: TECHNOLOGY, SOCIAL EFFECTS OF

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[P. T. DURBIN]

TECHNOLOGY, SOCIAL EFFECTS OF

A consistent, underlying theme of Vatican Council II is the importance of considering the specific qualities of culture and society shaping the contemporary world in its uniqueness. The Council directed its considerations to the concrete world of the 20th century, not to some abstract world without specific temporal definition. The concentration on this particular moment in space and time was to assure a proper understanding and embodiment of the reality of the Christian God who is appreciated as One who is immanent in transcendence, incarnate in divinity. The Lord is now present to and active in this world with all its uniqueness and particularities. The *Constitution on the Church in the Modern World* describes the present moment in human history as one profoundly unique in both social and cultural dimensions, so much so that one can speak of ''a new age in human history'' (*Gaudium et spes 54*). The range of change which brought about this new era is so pervasive that the Council admits that culture has taken a new form which in turn creates new ways of thinking and acting. To be a vital presence and force in this new context, the Church must understand this new situation and express its life in accordance with the dynamics of this new cultural setting.

Specific reference is made (ibid.) to the developments in modern technology because of its central influence on patterns of thought and action. Human thinking is more and more in the form of a ''technological mentality,'' a way of thinking that emphasizes analysis, planning, the use of specific techniques and, above all, the control of all the components in the situation. Besides the mindset which dominates a technological society, there are also the tangible results of that thinking in certain systems of operation and in the products created by research, planning, and production. From a religious point of view, the total range of technology deserves serious consideration and critical evaluation in terms of whether it enhances or detracts from the realization of the Kingdom of God on earth.