Book Reviews

Getting There from Here

Technological Man. The Myth and the Reality. VICTOR C. FERKISS. Braziller, New York, 1969. xii + 340 pp. $7.95.

Victor Ferkiss offers some insights into the crucial and difficult task of transforming industrial man—what we are—into technological man—what we could hope to become. In so doing, he has written an important and very readable book helping to refute the convenient thesis that "technology is in some fashion or other the factor that is making the radically new civilization possible and necessary and providing its organizing principle" (p. 14).

Ferkiss makes his first contribution by contrasting where the millenarian futurists, both the technologists and the humanists, see us as going with where we seem in fact to be. Second, he sets out the characteristics of technological man needed if we are indeed to make a society that uses its physical, biological, and social technologies for human enrichment. His third contribution is for the most part implicit: it has to do with the profound social, psychological, and political problems involved in becoming technological man.

Ferkiss's "central concern is whether, or to what extent, a new technological civilization and a new human type, technological man, is arising out of the womb of contemporary industrial society" (p. 56). Industrial society's "most striking elements were large-scale production and consumption of material goods, alienation from and war against nature, repression of the instincts for play or contemplation or their sublimation into competitive channels, and, above all, competition and war" (p. 54). Ferkiss argues that if there is to be a new technological civilization man will live by three basic principles: The first is "the new naturalism"—the principle that man is absolutely a part of a nature, a universe, that is always in process of becoming. The second principle, "the new holism," recognizes that "no part can be defined or understood save in relation to the whole." The third, "the new imminentism," sees that the whole is "determined not from outside but from within." These principles and their applications, which Ferkiss examines in some philosophical and operational detail, "provide the necessary basis for the outlook that must come to dominate human society if man is to survive the existential revolution already under way" (pp. 250–52).

The "existential revolution" refers to man's ability to make his environment and himself what he wills through his developing physical, social, and biological technologies operating in the social and psychological context of an increasingly dense and interdependent population. Ferkiss reviews the technological conjectures of the futurists as well as philosophical conjectures regarding the "meaning" and the society-transforming consequences of these technologies impacting on an ever more heavily populated world. His review is not of the gee-whiz genre; on the contrary, his examples and his criticism of what is implicit and explicit in them demonstrate how shallow they are or how they derive from the perspectives of industrial man. But he accepts as essentially certain that the technological expectations will be realized sooner or later.

Much of Ferkiss's book is an attempt to assess the extent to which the hopes and fears of the technological and humanistic futurists regarding the impact of these new technologies are substantiated by what is in fact happening. Is technological man already well under way or, contrariwise, is there good evidence that "the man of the future will combine the animal irrationality of primitive man with the calculated greed and power-lust of industrial man, while possessing the virtually Godlike powers granted him by technology" (p. 25)? Ferkiss surveys the putative impact of technology on the economic system, on political processes, and on life styles and culture. He concludes that

> Technological man, then, does not exist. There is no new man emerging to replace the economic man of industrial society or the liberal democratic man of the bourgeois political order. The new technology has not produced a new human type, provided with a technological world view adequate to give cultural meaning to the existential revolution. Bourgeois man continues dominant just as his social order persists, while his political and cultural orders disintegrate. [p. 243].

This reviewer and others would challenge the reliability and validity of some of Ferkiss's data as well as some of his specific diagnoses—this, not so much because we differ about what seems to be happening as because we are less sure that we can *know* what is happening, given the limitations of both our concepts and our data about the changing nature of our society. However, at least this reviewer heartily if despairingly subscribes to his conclusion.

From the three basic principles he proposes, Ferkiss derives a number of behavioral norms for a technological civilization and tentatively defends their operational plausibility. He says, ". . . man's economic and social life demands coordination . . . [and] must be determined by what is optimum for the total system . . . the ability of the system to respond demands maximum freedom. . . . This amounts to combining economic and physical 'planning' with cultural pluralism to the maximum extent possible" (p. 254). However, "unless the new outlook spontaneously permeates civilization, mankind will fail in any event" (p. 257). "What is required is that all . . . recognize . . . that the one intolerable action is the claim of any individual or group . . . to dominance and universality . . ." (p. 258). Such an approach would be "reflected in radical changes in our economic and political systems" (p. 259).

Ferkiss recognizes that among other issues his approach poses are the unresolved ones of social choice, and that the use of social indicators and other decision-making technologies will exacerbate the problem of choosing and compromising by making clearer what the trade-offs are and where the risks lie from ignorance about unanticipated consequences. He proposes possible ways around these system-disrupting

tendencies through a combination of social engineering techniques and the "will" to make overall social decisions. I am afraid, however, that his hopes for the decision-making and policy-planning technologies and concepts are rather in the same class of myths as those he earlier debunks. My present research and that of others examining the relation of formal decision-making methods to the way even the most "rational" and "innovative" organizations operate strongly suggest that the methods, the men, and the characteristics of problems to be resolved through deliberate choices are so far apart that we really have no adequate model now of what complex humans in a complex world could, even in principle, do to keep "the total system in equilibrium" (p. 262). Perhaps Ferkiss recognizes this when he says, "If this sounds utopian . . . utopia may be the only viable social system in the world to come" (p. 262).

If it sounds as though Ferkiss finally leaves the cat unbelled, I would argue that the situation is even more disheartening. The author omits attention to what seems to me to be the most disturbing fact of all: we don't *have* a bell, much less a skilled volunteer to attach it. What Ferkiss doesn't do at all, really, is wrestle with the problem of getting from here to there. He leaves it to the reader to use his sophistication about organizational behavior or his conventional wisdom to supply the sociopsychological processes that sustain what Ferkiss describes as the present state of industrial man. Because he foregoes such an analysis he gives the reader no basis for considering the processes and probabilities having to do with the prerequisite conditions for *changing over* to technological man. He says there are "certain patterns of human institutional and personal behavior that are almost as resistant to change as those of the lower animals and the social insects. Man is fundamentally oriented to scarcity, conflict, insecurity, fear, irrationality, self-centeredness and a host of social and cultural institutions that reflect these . . ." (p. 18). But he does not translate these into the social psychological processes of institutional behavior and of the maintenance of institutional structure that result, in Donald Schon's phrase, in "dynamic resistance" to change. The risks of individual, interpersonal, and organizational failure involved in deliberately accepting the uncertainty that must accompany organizational and individual change are usually too great for men to take willingly when things are going well and when men and institutions have been successful. They are so great, so threatening, that men and institutions will insist that only incremental changes are needed to keep things going well or will resort to the mythology Ferkiss debunks and insist the changes are already happening.

How to get men and their institutions to make the radical leaps needed to move through the turmoil of change in the direction of technological man is a question to which we simply do not have sufficient conceptual, much less operational, answers. The evidence indicates that basic organizational change can occur through disasters, or by deliberate organizational change programs. The latter must be directly and continuously supported from the top of the organization over many years of unremitting and highly organized, self-conscious effort. Such deliberate efforts have been rare, and even then the change—if it occurs—is mainly in the direction of "enlightened" industrial man. Thus our most likely chances for change will be as responses to social and natural disasters. But under such conditions the changes produced are unlikely to be in the direction of technological man: the "seeds beneath the snow" that Ferkiss believes may be emerging are more likely to be incinerated or beaten to pulp.

By what he says and by what he doesn't say Ferkiss makes an important contribution that can help us recognize that we don't now know how to become technological man, "the race's only salvation."

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Drugs and Insecticides

The Enzymatic Oxidation of Toxicants. Proceedings of a conference, Raleigh, N.C. ERNEST HODGSON, Ed. North Carolina State University, Raleigh, 1968. viii + 229 pp., illus. Paper, $2.

This book is a collection of papers presented by specialists in drug and insecticide metabolism. The papers, which include mostly the original work of their authors, are well referenced and supplemented with discussions, and the book is an excellent collection of up-to-date information on oxidations in animals, plants, and environments.

The introduction by Ernest Hodgson, outlining the historical development of the subject and the objectives of the conference, is followed by three papers, by H. Kamin and B. S. S. Masters, T. E. Grams and J. R. Fouts, and H. Remmer and co-workers, on enzymatic oxidations of drugs and other xenobiotics in mammals. Description of the functions of individual components of the electron transfer system in microsomes responsible for such oxidations has provided clear evidence that this system is composed of a specific flavoprotein, an unknown component, and a cytochrome, P-450. Studies of the distribution of oxidizing enzymes in microsomes from smooth and rough endoplasmic membranes indicate that most of them are present in the former. The enzymes are induced differently in the endoplasmic membranes by inducers which may differ in their pharmacological action. The inducers can, in addition to increasing the amount of P-450, change its binding moieties, as is demonstrated by the differences in spectral changes of the induced cytochrome P-450 on addition of substrates. These excellent papers, while interpreting biochemical, pharmacological, and morphological data, raise the question whether there are numerous inducible specific oxidases or one or very few nonspecific ones with different protein-binding moieties.

As in mammals, the rates and products of similar oxidations of xenobiotics differ from species to species in other groups. Published data of Brodie and Maickel, Adamson and co-workers, O'Brien, and others are examined to reveal differences in the microsomal oxidations in plants and animals. The known factors responsible for such differences, along with the theories about the evolution and function of these enzymes, have been described. In addition to species differences, great variations among strains and even in sex and age of individuals have been noticed in regard to these enzymes.

The presence of inhibitors in insects, investigated by J. N. Smith and coworkers, makes it difficult to correlate enzyme activity with oxidations in vivo. The inhibitors can be removed by centrifugation or dialysis or by the addition of albumin. In insects, the oxidation of insecticides in addition to detoxication can also produce more toxic metabolites, as is discussed by P. A. Dahm and T. Nakatsugawa. The oxidation of insecticides in environment