Book Reviews

Computers and Cultural Imperatives

The Conquest of Will. Information Processing in Human Affairs. ABBE MOWSHOWITZ. Addison-Wesley, Reading, Mass., 1976. xvi, 366 pp. Paper, $8.95.

The Conquest of Will is the most comprehensive review to date of the literature on the social effects of computers. Here the reader will find accurate summaries of the literature on how computers have affected corporate decision-making, work, education, health care, privacy, and political decision-making. Yet there is more. Mowshowitz, a computer scientist, is interested in assessing the broad social and cultural meaning of the computer. It is this assessment that sets the book apart and makes it a significant contribution.

Mowshowitz's central thesis is that the growing use of computers in advanced Western societies strenghtens ongoing trends and combines with extant political forces in such a manner as to stifle the will of men to change society along more humane lines. Computers lead to centralization of power, loss of citizen participation, invasion of privacy, growth of administrative leviathans, legitimation of technical "experts" at the expense of poets, and a denigration of faith in the wisdom of ordinary citizens.

The computer does not create these trends or forces, but does facilitate their action, does in fact serve them, and in any event does not challenge their power. Applications of computers in government cause "government bureaucracy to gain power at the expense of the general electorate and non-government people." In health care, "the ability of the computer to facilitate an increase in productivity and efficiency does not guarantee an equitable distribution of health care services" but rather serves the interests of bureaucratic rationalizers (administrators) and "professional monopolists" (the doctors). In education, computer-assisted instruction "promotes those functions which are most readily implemented" (like rote learning), "panders to institutional rigidities," and "reinforces existing administrative practices" such as classifying students into learning tracks, regulating troublemakers, and punishing the noncompliant. The work on artificial intelligence poses a threat to the dignity and identity of man by replacing the full complexity of human intuition with reductionist models of thinking. Computer art, music, and poetry are not an expression of beauty, of being, of becoming, but instead represent a program in a factory of the spirit. To such machine-culture products we can only say "so what?"

To large extent these conclusions are not new. They reflect the literature on the social implications of computers that was produced in the 1960's. Unfortunately Mowshowitz's review ends in 1974 and omits a number of empirical works by social scientists that give good accounts of more recent developments. Yet these new works would largely support Mowshowitz's conclusions.

Students of technology and society have largely moved away from the view that computers (or other technologies) act on society in the manner of a ship at sea colliding with another. Rather, new technologies are shaped by extant political forces, cultural values, and long-term social trends. It is thus fruitless to ask what are the social effects of computers without asking who is developing the technology, what interests it serves, whose values are preserved or destroyed, what costs it imposes, and who pays. Perhaps the most unsatisfying aspect of Mowshowitz's book is its lack of new empirical material to answer these questions. Much of the work he cites on the social effects of computers is old (some done in the late 1950's) or is of dubious validity or generalizability (especially that having to do with computers and organizations), and and some is just speculative. Mowshowitz uncritically accepts the "findings" of the work, adds little insight from his own experience as a practicing computer scientist, and often leaves the reader wondering about the validity of the conclusions.

Mowshowitz's most provocative contribution comes in his search for a villain. Why do computers (and other technologies of advanced societies) lead to the conquest of will, limitation of freedom, and loss of human dignity?

The traditional view of the predicament of Western society is that the drive toward material progress neccessitates a growing division of labor and specialization. This in turn calls forth large, centralized administrative structures whose function it is to coordinate and if need be control through coercion the ever more complex interactions, groups, and forces in society. Computers facilitate the coordination of diversity and the control of disorder. Without them we might not have efficient, relatively low-cost health programs, welfare systems, housing programs, and other governmental activities that we desire. Likewise with private sector goods. Of course we can have these things without computers, but the cost would be high and necessarily (so the argument goes) there would be less service offered. In any event, as a result of the drive toward more goods and services, the good life, there arise structures of control and coordination that limit our freedom, subject us to formal rules and regulations that do not allow for human diversity, and alter the relation of citizens to society to one of subjects to regime.

In this view, which the reviewer shares, large-scale social change takes place rapidly without a vote, public debate, or social confrontation. It is a slow, day-by-day drift that seems never to change direction.

Mowshowitz does not reject this view but seems to turn it on its head. For him it is not a growing complexity of society that calls forth large, centralized power structures. Rather, it is the human and cultural imperative toward more power that leads to complexity, which then calls forth more sophisticated information-processing tools capable of serving the expansion of power.

But whence the imperative toward more and more power? For Mowshowitz its primary source is the acceptance by Western culture of the medieval view that everything must have a cause because God doesn't fool around. Acceptance of this view by Renaissance scientists like Bacon, and thereafter by the rest of Western culture, led to a reductionist spirit of science which seeks to intermediate between man and environment, alienating man from direct experience of reality, and ultimately coming to control his perceptions of nature. That the reductionist views of science provided tools for politicians and society only encouraged widespread acceptance

of the scientific world view and its ultimate use to facilitate the expansion of power. If the alchemists had succeeded in tapping mystical powers by wringing gold out of lead and tin, the world would indeed have been different.

The villain, then, is culture, our culture. Mowshowitz finds in the acceptance of the scientific view the ultimate conquest of human will:

> Most of the stories we have cited, bear witness . . . to an inherent contradiction in the conquering spirit of science and technology. The conquest of nature, space, and time is seen as a paradoxical victory over the human ego. As man extended his dominion over the natural world, he became alienated from the sources of his vitality. Through obsessive exercise of the will to power in the elaboration of technique, the will itself became enfeebled and subject to control by autonomous forces linked to mechanical progress. . . . This procedure has its counterpart in the evolution of industrial technology and social organization. In both cases, it is reflected in the imperative to divide and conquer [p. 313].

In the end, Mowshowitz concludes that computers in service to this ever-expanding power nexus are not inevitable but instead reflect a political and deeply seated cultural faith. They can be overcome, for "there are always other choices so long as the paralysis of will is not complete."

In point of fact the alchemists did not succeed in getting gold from baser elements whereas science did succeed in its more limited objectives. It is not manifestly apparent to me that acceptance of the scientific world view has alienated us from the "sources of our vitality" (whatever they may be). It is even less apparent to me that this medieval search for a first cause of Western cultural error explains anything about the role of technology and computers in modern society.

In fact, Mowshowitz's cultural critique leads him into some curious positions. He agrees with most that computers lead to centralization, diminution of opportunity for participation by ordinary citizens, and cavalier attitudes by administrators toward basic human dignity, the loss of which never appears as a cost in cost-benefit studies. Yet he does not explore the possibilities for altering the balance between organizational gargantuans and the individual through legislative and political means. He agrees that computers threaten individual privacy, but is critical of reform efforts in the United States which have legislated protection of confidentiality, access to government records, privacy, and due process. These efforts Mowshowitz believes actually legitimate the further operation of computer-based information systems without challenging their existence. He believes in smaller social and economic units and believes that a restriction of choices of available goods and services would result from the replacement of large units by small. Unfortunately he does not explore this possibility specifically by detailing the human costs of going backward in time. Critical of reformist efforts, Mowshowitz asks us to exercise our willpower to define new alternatives for organizing society and distributing the benefits. Unlike the counterculture school, however, he does not provide us with new myths around which we could reorganize society. Neither does he provide us with any assurance that replacing the scientific world view with another would lead to any less self-deception than now prevails. The scientific world view may be reductionist, but then again so are most world views.

In the end, instead of attacking frontally the political and corporate forces that are in fact shaping this technological world to fit their needs, Mowshowitz attacks Western culture. Whatever we may think of Western culture it is a sure bet that to change it is a much more difficult, problematic, and long-range enterprise than to change the more proximate causes of our predicament. Moreover, within Western culture are powerful nonscientific values which can be (and indeed have been) used to balance the effects of a value-free science. The notions of equity and justice, dignity and freedom, which are a part of Western heritage in religion and law have indeed been sacrificed at times to other values such as scientific rationality and efficiency. Where this has happened it has usually been a result of political decision-making, and need not be ascribed to the conquest of the human spirit.

It is then to these concrete social and political forces and groups that currently are designing the future of our society in corporate board rooms and government agencies that we must turn our attention. Is it possible to put existing computer and telecommunications technology to use in such a manner as to strike a more desirable balance between the individual and the organizations that presumably serve him? Is it conceivable that the traditional management information system which funnels information always upward can somehow operate just as efficiently in reverse for quite different reasons? How might a technology be developed that would allow citizens to discuss important issues, organize coalitions, and press home their views? What kinds of groups would support such proposals? What are the costs of developing and operating a more humanized technology? Would the public believe the costs worth the results?

The answers to these questions depend on patient empirical research, demonstration projects, and experiments by social scientists, engineers, and computer scientists working together. While such projects exist they are few and far between. In their absence Mowshowitz is surely correct in his belief that we shall be conquered by the very tools we design to liberate us.

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Issues in Population Genetics

Population Genetics and Ecology. Proceedings of a conference-workshop, Israel, March 1975. SAMUEL KARLIN and EVIATAR NEVO, Eds. Academic Press, New York, 1976. xiv, 832 pp., illus. $25.50.

Contrary to the impression the title may give, this collection of papers contains relatively little of what an ecologist would consider ecology. There is a fair amount of outdoor population genetics, some British-type ecological genetics, a number of considerations of geographically structured populations, and even reference to r and K. But only passing consideration is given to the regulation of population densities and to the interactions among populations of different species. Indeed, in only one of the many theoretical papers is the parameter N anything other than a constant. On the other hand, the collection is an excellent testimony to the diversity of approaches and concerns of contemporary evolutionary genetics. These 31 articles offer the reader a good view of where the subject is now and a preview of where it is going. Many of these papers reflect the increasing attention that both theoretical and empirical population geneticists have been giving to the realities of organisms living in natural habitats. I assume that is what motivated the editors to include the word ecology in the title.

The articles are grouped by approach rather than subject: Field and Laboratory Studies; Models and Evidence; and Theoretical Studies. Each section is preceded by remarks by the editors which summarize the articles but do not discuss them or attempt to relate them to the subject at large. Comments by other contributors are included for only a few papers. The concluding section of the volume, Problems, Objectives, and Comments, is the edited transcript of a "free-for-all"