

Book Reviews

Centering on Human Requirements

The Computerized Society, by James Martin and Adrian R. D. Norman. /New Jersey: Prentice-Hall, 1970. 560 pages. \$10.95.

Computers, Communications and the Public Interest, edited by Martin Greenberger. /Baltimore: Johns Hopkins Press, 1971. 315 pages. \$12.50.

Information Technology in a Democracy, edited by Alan F. Westin. /Cambridge: Harvard University Press, 1971. 499/ /pages. \$12.50.

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Many voices speak from the pages of these three volumes about the public policy concerns that are being--or will be--raised by the marriage of the two technologies, computers and electronic communication. But the significance of these books requires a frame of reference larger than the nominal issues of civil liberties, privacy, etc. raised by the authors. One needs to step back to see that these issues are growing from the same soil that has borne the ever-spreading interest in mysticism, astrology, witchcraft, and the turning-inward movements that include yoga, natural foods, and the human potential movement.

More problems than Hopes

What these seemingly diverse developments share is a view of the world in which the future has lost its value as a positive reference point toward which man might direct his efforts. Instead, it has become empty, surely no better than the present, and in many minds bound to be worse. The culprit: man and his technologies which when projected forward raise more problems than hopes.

This has not always been so. Those of us growing up in the '40s can remember the issues of Popular Science describing the gadgets and products of the future. We looked forward with impatience to the time when we could have and enjoy these wonders. In recent years, though, as man has begun to view the secondary consequences of his inventions, a growing fear of the

future has set in. As the recent Club of Rome--MIT study, The Limits of Growth, demonstrates, there is no way that you can make projections based upon man's current actions and knowledge without coming upon a future to which few would aspire.

But, we must have goals and purposes. As cybernetic beings, our rewards, e.g., happiness, success, are all measurements of movement toward a goal. Now that technology has seemingly messed up the bright, shiny dreams of our youth, what alternatives are there for putting purpose and direction back into our lives?

Is the only answer to be a turning in unto ourselves because the complexities and nothing-works programs of today's society provide little satisfaction? How paradoxical it would be were this to happen at the time when the technological developments that appear so threatening also provide man with new potentials for dealing with the complexities and dehumanizing influences in the real world.

Feelings of Unease and Awe

Perhaps the most ubiquitous of these technological developments has been the growth of computer systems. Feelings of unease and awe touch almost everyone who considers the human-like and superhuman-like capabilities of this machine that amplifies intelligence, or some form of it, as the machines of the 18th century amplified physical strength. The three books under discussion here each explore the computer and its extensions via electronic communication in terms of both the positive and the negative consequences for society with particular reference to the issues of control, privacy, and civil liberties. Although they have this fundamental similarity, there are several differences in format and approach that might interest the prospective user of these volumes.

Martin and Norman's The Computerized Society stands apart from the other two in that it is an authored book rather than an edited collection. Its layout, organization, and use of illustrations make it a good candidate for textbook use. It could provide a general survey of the field to the uninitiated and fill in gaps for the professional who lacks a broad perspective on all aspects of present computer use and future consequences.

In terms of general organization, The Computerized Society is similar to Westin's Information Technology in a Democracy. Both present first the positive view of the technology;

Westin calls his opening section "Descriptions of Developing Systems by Their Advocates," while Martin and Norman, more simply, label theirs "Euphoria." This positive base in both cases serves as the foundation for the greater portion of the discussion of what could go wrong, what has gone wrong, and, unless something changes, what will go wrong.

A comparison of the formats of the two edited collections, i.e., Westin's, and Greenberger's Computers, Communication and the Public Interest, can serve to illustrate some interesting characteristics of this form of book as an information storage and transmission device. Both editors have similar purposes in attempting to deal fairly with a multisided issue. Several contributors appear in both volumes, including Westin himself. Professor Westin's book can be viewed, as he suggests in his preface, as a debate between two sides: the one advocating the use of computers to solve problems of public policy and administration, and the other calling for caution and skepticism. It is hard to judge the "fairness" of this approach since the strongest arguments may not have been included. The subjects are quite well explored, both pro and con, although the arguments of the cons seemed to be placed in the volume so as to have the most effect.

Greenberger's collection provides an interesting illustration of the use of print with the effect of reader interaction built in. It should be noted that his volume originated as a series of lectures and discussions sponsored by Johns Hopkins University and the Brookings Institution in 1969-70. Each of the eight major presentations is followed by two prepared critiques, a panel discussion between speaker and the critics, and then a subsequent dinner discussion with an expanded panel of about twelve persons. The effect is that the reader finds the questions and comments that occur to him as he reads each presentation are brought out and answered during the critiques and discussions. To the extent that there are pros and cons on these issues, this format brings them face to face, speaking to the same points, rather than leaving it for the reader to try to find two opposed views that are really discussing the same thing.

So much for the three books as medium. What about their messages?

To Change Man or Technology

Many of the writers in the three volumes have had the opportunity to experience the "moderating effect of the real world upon Man or technologies' promise." Some, as planners,

have seen their designs compromised with reality; some, as users, have seen their personal needs and goals compromised with the requirements of the "system" or machines.

One might suppose the authors would propose two different but corresponding solutions: in the first case, change *man*; in the second, change *technology*. But, this is not what happens. True, many if not most of the writers do fall into these two camps. Some, such as Harold Lasswell (in Westin), conclude from their experience that man must learn to adapt to the machine--to revamp his concepts of privacy, of human dignity, of governance.

Others too, in all three volumes, present the fears and the case for the control of technology. Writers such as Gallagher and Ferry (in Westin) call for legislative and constitutional actions to head off the anticipated disruptions. Others call for "technology assessment" to predict all future consequences before use. The fear that drives this impulse is more than a fear of the unknown. It is a fear of what appears to be the uncontrolled development of science.

However, man does not develop by design and most of the significant effects of any technology are not foreseen at the time of its development. As Herbert Simon (in Greenberger) points out,

...The dream of thinking everything out before we act, of making certain we have all the facts and know all the consequences, is a sick Hamlet's dream. It is the dream of someone with no appreciation of the seamless web of causation, the limits of human thinking, or the scarcity of human attention.

The world outside is itself the greatest storehouse of knowledge. Human reason, drawing upon the pattern and redundancy of nature, can predict some of the consequences of human action. But the world will always remain the largest laboratory, the largest information store, from which we will learn the outcomes, good and bad, of what we have done. Of course it is costly to learn from experience; but it is also costly, and frequently much less reliable, to try through research and analysis to anticipate experience.

In the long run, the most significant contributions in these books might come from those who fit in neither camp, seeking to change neither man nor machine. Instead, they question the assumptions we have made about each. What they suggest is a redefinition of reality, taking as its reference point individual man and his fundamental needs for growth. With man's needs at the center point, it forces one to recognize that the fundamental question is how to *influence* these ends, rather than how to *control* the means for reaching them.

James Schlesinger (in Westin) states the case: "... .at its best, (systems) analysis can shed some light on the costs of accepting one objective at the expense of others. But there is a danger that analysis may help to disguise fundamental choice problems as efficiency problems One must face the fundamental choice issue *before* one seeks efficiency, or the issue of choice will be prejudged."

The only thing that changes...

Within this person-centered framework, several authors, principally Herbert Simon, Anthony Oettinger, and James Coleman (in Greenberger) and Emanuel Mesthene, Erich Fromm, James Schlesinger, and Oettinger (in Westin), suggest that man and his needs do not change over time. The only thing changing is man's sense of which of these needs he feels it is *possible* to deal with successfully and which, correspondingly, become the goals of his efforts.

The problem is that technology contributes to a continuous inching forward of the possible, and when the movement is rapid, as in the case of electronic communications and computer technology, man is left behind with his previous assumptions of what was possible, applying his tools through McLuhan's "rear view mirror." As Harvey Brooks suggests (in Greenberger),

"It is not the secondary consequences of technology, but the secondary and hidden consequences of achieving our 'needs, goals, and aspirations' that are killing us... .we must continually adjust them as their achievement brings us new knowledge and insight."

This observation is particularly important if one views man as turning inward today because he cannot find purpose in the external world. Happiness, success, or whatever you want to call the kicks we get from working toward something desirable is, again, a consequence of the *striving toward* a goal, not its attainment.

In terms of daily survival, the majority of the western world has reached the carrot on the end of its stick. It must now extend it again with a new "carrot," one which was always in man's hierarchy of needs, but which heretofore was not within the realm of possibility.

There are rich examples in these books of how easy it is to find these new answers when you ask a different question, one in which man is a constant and technology is assessed against that criterion. Of particular interest to those dealing with education and communication will be James Coleman's "Education in Modern Society" (in Greenberger). Here he deals not with the application of new communication technologies in the school, but rather the

...changes in communication structure *outside* educational institutions,” powerful and pervasive changes that have unplanned and unanticipated effects on schools. These effects are often not recognized until after they have wrought their changes. The reality perceives the promise and is more powerful than the expectations.

These indirect effects are byproducts of technological change in the communication structure of society. As such, one might expect them to be less important than the effects of direct planned introductions of new communication technology in education. This, I believe, is not so today. The indirect impact of changes in the communications structure of society has been and will be so great that the technological changes in the schools, themselves, must take place within the new frame that these developments create.

As an example of the effect of redefining reality in man-related terms, Herbert Simon suggests that *knowledge* might be better defined as man's access to information, rather than its storage. Within this frame of reference, it is not information overload that is the problem, but instead, the finite quantity of attention that each decision maker can provide. Restating the problem as "attention scarcity" provides several novel alternative answers which might not have been perceived had the problem been defined in the conventional way as "too much information."

On Redefining Reality

Anthony Oettinger, also working from a similar person-centered perspective, uncovers two "new and significant" principles. These, he admits, could have been stated at any point in history by governments of the tribal type. They have been lost, however, for the western world until the advent of what he terms "*compunication*" technology, with its resulting retribalization of modern man.

The first of these he calls the Chief's principle: direct access to, and control and supervision of, all systems; and the second, the Indian's principle: unfettered access by all hierarchies to all systems.

The first principle increases the practical ability of . . .chiefs to choose what information to receive themselves and what information to have their subordinates receive. It allows them to zoom at the most knowledgeable people and the most relevant data wherever in the hierarchy or world they may be.

The second principle puts analysts and experts in constant touch and interchange with people and data elsewhere in their own and other hierarchies, without altering their responsibility and the focus of their attention. As Indians, they are therefore better prepared to volunteer significant data or respond to requests in more timely and intelligible fashion. As chiefs, they are better prepared to make decisions within the scope of their authority, and they can expect the same from *their* Indians.

A fiction of the data processing profession has it that decisions are dramatic, discrete positive acts, while in reality the decision process is diffused throughout hierarchies, spread out over time, and bathed in a constant flux of change. Because of this fiction, the conventional emphasis on information systems for chiefs, reflected in the first principle, is generally not balanced by an equally important concern for the Indians. The dependence of effective Indians on their jumpers, stressed in the second principle is usually neglected. ...Of the incredibly large amounts of information conceivably accessible to the chief executive, most of the detailed, raw information that we can now handle with computers is best suited to the needs of the Indians. The way the chief gets informed at this stage is by access to knowledgeable people. God help us if we depend on taxonomy!

This business of information systems for “management” is a snare and a delusion. Management gets better informed by having better informed Indians. For those who still seek hope, the new frame of reference centering on human requirements provides a view of the future in which neither man nor machines have to change much before human progress can take place.

For example, on the one hand today we find mankind seeking direction (even if it is backwards), needing positive purposes and goals; and on the other hand, a combination of technologies that can permit him to work without long range goals. What these technologies provide is a way to proceed with only general directions in mind, establishing and using short term goals or futures as center points for organizational efforts. Communication technologies provide the connections for the interaction and feedback necessary to have continuous information regarding progress toward a goal, information needed in order to adjust courses, and sometimes to change goals.

Toward Short-Term Goals

In effect, it is possible, as one author suggests, for "our organizations and many of our activities [to] be looked at as experiments." Thus, our organizations can function (as does man himself) in a problem solving, goal seeking mode. This possible dream requires those working with technology to accept the possibility of applying their efforts in an entirely different manner, as suggested by the noted biologist George Wald in the conclusion to Greenberger's book. He discusses the "two different processes of design: *Technological* and *Organic*."

"Technological design begins with specifications. One lists the specification and then attempts to realize them as best one can." The mechanisms of organic design, which Darwin characterized as *natural selection*, "are almost the reverse of those of technological design. It begins with an endless outpouring of variations together with a mechanism of inheritance." This can be an inheritance of knowledge, behavior, or culture. "

Natural selection also has a third component, a selective factor, an element of competition....," *survival of the fittest*. Those forms "that work a little better are permitted to go on, while those that do not work so well are eliminated."

Natural selection is almost the reverse of technological design. There are no specifications. It is a process not of authorship but of editing. . . .Compared with technological design, this process seems slow, wasteful, and inefficient. But, we should think well of it, for it has given us all the living organisms we know; and the simplest of living organisms is more intricately designed, more adaptive in its responses, more closely integrated with its surroundings, more flexible in meeting new challenges, and (to cite a modern value) more highly miniaturized than the most complex of technological devices.

Is mankind willing to look at its technologies through "organic" eyes? The possibility of bringing the world of science and technology into consonance with man is no "sick Hamlet's dream." But neither is it as simple a task as the bringing together of C. P. Snow's "two cultures." For the changes that must occur are equally needed in both cultures -- the humanities and the sciences. Each has its jargon intended to keep the other uninformed and impressed; both in their way have stopped questioning and proceed from outdated assumptions of what roles institutions, technology, and even man can play in the order of things.

It is apparent that if we want to deal with the complexities of the present day with systems and machines that behave like men, then we will have to ask men to stop thinking like machines.