Book Reviews

Social Needs and Technological Promise

Science, while assiduously avoiding criteria of utility, has become an indispensably practical institution of modern society. Politics, the art of the possible, relies increasingly on science to define the limits of the possible and to illuminate technological pathways toward solution of social problems. World economic development is a case in point. The continuing pressures of population growth negate the productivity gains of many developing nations. The extraordinary rates of growth and change in science—greater than for any other social phenomenon—nurture the hope that new discoveries may hold the key to this predicament.

What effect does a decade's scientific progress have on prospects for economic development? This question is posed by Richard L. Meier in the second edition of **Science and Economic Development: New Patterns of Living** (M.I.T. Press, Cambridge, Mass., 1966. 292 pp., illus. Paper, $2.45), which he offers as "an experiment in judging the effects of progress in science upon the developmental prospects for the world." Rather than prepare a conventional modernization of his earlier text, Meier chose to let the original stand and to append comments to sections and tables where recent findings were of interest.

The first edition, in 1956, was an unusual attempt to combine a technical analysis of the interaction between human needs, population growth, natural resources, and developing technology with an imaginative exploration of the social problems and possibilities inherent in new patterns of living. After taking the measure of the world predicament—the need to achieve an adequate standard of life in the face of continuing population growth—Meier concluded that there were no material barriers to resolving it. Science, he found, could depict a range of possible futures to meet the challenge; the basic problem, not surprisingly, was to discover "how to get from where we are to that more desirable state." In other words, the overwhelming task was—and is—social, a matter of "revamping human institutions so that the opportunities presented by new technology can indeed be grasped."

The second edition, a decade later, finds minor changes in the scientific and technological aspects of the problem and a major shift in a key social parameter. Despite evident progress in many fields of applied research, the 13 problems in fundamental science listed by Meier in 1956 remain "unresolved" in 1966. He found no substantial change, furthermore, in the levels of production of food, fibers, energy, and materials which seem attainable on a global scale. Although science, using systematic methods and a cumulative body of knowledge, is useful for "clarifying choices in the range of possible futures," the product of a decade, as depicted by Meier, has had only a marginal impact on that range.

The most striking change is that earlier consensus views of future world population are now believed to have been serious underestimates. United Nations estimates of 1963 anticipate a population in 1970 equal to that projected for the year 2000 in the 1950 data used earlier by Meier, with population now expected to double again between 1970 and 2000.

How, then, do we interpret the data of this unusual "experiment"? It is here that the book is disappointing, for the author does not explicitly come to grips with the question which ostensibly motivates the new edition. Relatively little has been added for this edition, reinforcing the notion that the abundant scientific product of the intervening years does not require any qualitative change in the analysis. Because the implications of this result are so great, it is regrettable that Meier does not take a clear position on the interpretation of his findings or confront some of the obvious questions they raise.

Nevertheless, there are other values in a reappraisal of this work. The idea of "total systems analysis" of social problems was novel in 1956, but faith in its efficacy is growing more common at the moment. This case suggests both the value of the method and its weakness. Because of its scope, any analysis of this sort is necessarily open to questions of detail. Despite these, and despite overtones of technological reductionism—probably inherent in the technique—the result of Meier's work is effective and thought-provoking. Yet the rigor of the technical analysis is weakened by the vagueness of our understanding of society. Meier's dependence, for example, upon shifts in "informed opinion" about the central social parameter—rates of population increase—emphasizes the social character of the basic problem, but gives rise also to awkward questions about the validity of any analysis along these lines.

In sum, the book illustrates both the power of science and its limits. The social sciences, evidently, can have a multiplier effect on our ability to apply the methods and results of the "hard" sciences to large-scale social problems. Although sober analysis shows that known resources and known techniques can be used to attain a rationally established minimum standard of living, social and political obstacles to an "adaptive society" frustrate present hopes of realizing such a future. It would be a cruel joke if man's expanded sense of what is technologically possible were to serve only to make him aware of what he is denied by our primitive understanding of the social arrangements which might make such possible futures real. To escape this dilemma we require fundamental advances in the social sciences beyond any which can now be foreseen.

RICHARD S. ROSENBLOOM
Program on Technology and Society,
Harvard University,
Cambridge, Massachusetts

Vision

Seeing changes with circumstances and with individual experience. Much of the process is rooted in the hereditary structures of the eye and the highly organized neuromuscular system. Comparative and evolutionary studies continue to tell us more about animal as well as human vision, and the excitement of these studies has been