Technological Choices

Appropriate Technology and Social Values. A Critical Appraisal. Papers from a symposium, Racine, Wis., June 1978. FRANKLIN A. LONG and ALEXANDRA OLESON, Eds. Ballinger (Harper and Row), Cambridge, Mass., 1980. x, 216 pp. $19.50.

We live amid the elements of modern technology, accustomed to swift transport across oceans or continents, instantaneous global communication, a level of agricultural productivity that permits a handful of Americans to feed the rest, and much more. And new things keep coming along.

Are we getting too much of a good thing? Define good.

Is the acceptance of continuing technical change a necessary evil of life in this corner of a crowded planet? Define evil.

Can an industrial society find sensible ways to control emergent technologies so as to encourage the valuable and limit the damaging ones?

These questions have been raised and debated periodically in the Western world since the first Industrial Revolution. The latest manifestation of Western man's long-running love-hate relationship with technology centers on the concept of "appropriate technology." In essence, this concept reminds us that alternative technologies are available or could be developed for many tasks; as the old adage goes, there's more than one way to skin a cat.

That premise is widely shared; the argument begins when advocacy of the principle of "appropriate" technology is turned into a critique of the inappropriateness of technologies in use. The critics ask why the Western world chooses "hard," that is, centralized, environmentally degrading, technologies when it has available "soft" alternatives. Despite an apparent concern with technology, the critique is really aimed right at the dominant institutions and values of the Western industrial societies.

A second debate centers on the role of technology in economic development. The distinctive institutions and values of the developing nations logically should influence basic technical choices in directions quite different from those taken in Western societies. How can those nations manage the development process

in ways that keep options open in the face of forces encouraging replication of Western technologies suited to a markedly different social and cultural milieu?

This interesting book makes available to a wider audience the papers prepared for an international symposium on these issues. A distinguished group of social scientists and public servants discusses the conceptual, philosophical, and practical issues wrapped up in these debates. The papers are thoughtful, informative, and readable.

The book is in two parts. The first, Appropriate Technology as Concept, is a set of diverse and engaging explorations of the linkages between technological choice and social values. As Paul DeForest observes, "the judgement of appropriateness requires a choice among values, and since values are often in conflict the selection of appropriate technologies is deeply imbedded in the political process."

In the industrialized world, the marketplace often provides the mechanism by which those conflicts are resolved. In that setting, "appropriate technology" provides a rubric for the advocacy of "alternative technologies" and a challenge to established institutions. Langdon Winner traces the intellectual history of appropriate technology as a social movement that illuminates "a crisis of authority . . . in which formerly sacrosanct institutions of modern technology have become the object of direct philosophical and political criticism."

A rebuttal of the critique of modern technology is offered by Harvey Brooks. Brooks suggests that current technologies and their alternatives are complementary rather than mutually exclusive and hence likely to coexist in different "ecological" niches. Part 1 ends with a paper by John Montgomery tracing the ways in which values are embedded in the processes of social choice.

The papers in part 1, together with Franklin Long's concise and useful introduction, could stand by themselves as valuable reading for anyone interested in the subtle and complex interactions of technology and society.

Part 2, Appropriate Technology in Practice, is principally a review of experience in parts of the developing world.

It begins with an analysis by Gustav Ranis of the role of technology in the development process and ends with an imaginative and challenging essay by Kenneth Boulding. In between are four authoritative chapters characterizing a variety of approaches to social control of technological choices in development of the economies of China, Ghana, India, and Korea.

In sum, this book offers a coherent and dispassionate review of issues of central concern. While the energy and creativity of the more impassioned advocates will surely continue to provide the driving force in the necessary discourse on technology and values, the sober voice of academic appraisal provides the necessary counterpoint. Long and Oleson have provided a baseline against which future developments of the themes of appropriate technology can sensibly be appraised.

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Mass Concentration

The Large-Scale Structure of the Universe. P. J. E. PEEBLES. Princeton University Press, Princeton, N.J., 1980. xvi, 424 pp. Cloth, $30; paper, $9.95. Princeton Series in Physics.

The author of a book with the title *The Large-Scale Structure of the Universe* has license to talk about anything, with the attendant risk of being taken to task for not talking about everything. This book is a thorough and scholarly account of the development of structure in the universe through the gravitational aggregation of very large distributions of matter. This is the presumed mechanism by which galaxies, clusters, superclusters, and the universe itself evolve.

A major part of the discussion uses only Newtonian gravitation. This is not a cheap pedagogical trick. The approximation is carefully justified on the basis of general relativity. For example, the Newtonian gravitational potential in an infinite universe is carefully defined. The six chapters of the book are divided into 97 sections, and 23 of these are devoted to Newtonian dynamics. Fourteen of the later sections deal with situations where space-time curvature cannot be neglected.

The heart of the book is chapters 3 and 4. Chapter 3 covers the descriptive statistics necessary to "see" the large-scale