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Book Review of "A Theory of Technology"

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out of date, yet he does not discuss why he thinks Popper to be wrong or oversimplified, nor does he elaborate on alternatives to the falsificationist criterion. This oversight could give the mistaken impression of science as *vox populi*. This is a minor criticism, however. Overall, the editors have done an outstanding job in organizing this book, and the contributed chapters are of unusually high quality for a symposium volume. I would not be surprised if this book strongly influenced the field of community ecology for the next eleven years.

ROBERT CRAIG SARGENT, *T. H. Morgan School of Biological Sciences, University of Kentucky, Lexington, Kentucky*

ENVIRONMENTAL IMPACT ASSESSMENT, TECHNOLOGY ASSESSMENT, AND RISK ANALYSIS. *Contributions from the Psychological and Decision Sciences. Proceedings of a NATO Advanced Study Institute held at Les Arcs Conference Center and Resort Complex (Bourgh-St. Maurice, France), August 21-31, 1983. Advanced Science Institutes, Series G: Ecological Sciences, Volume 4.*

Edited by Vincent T. Covello, Jeryl L. Mumpower, Pieter J. M. Stallen, and V. R. R. Uppuluri. Published in cooperation with NATO Scientific Affairs Division by Springer-Verlag, Berlin and New York. \$127.50. x + 1068 p.; ill.; index. 1985.

These 37 papers, presented by an international group of researchers in the fields of psychology and decision science, are grouped into five sections. The first section provides an overview of research in the field. Sections II and III present the perspectives of psychology and decision and system science. These two sections are divided into theoretical and methodological contributions and case studies. Section IV presents cultural philosophical perspectives. Policy analytic, administrative, and legal perspectives are contained in the final section. These broad topics cover "several areas of research, including quantitative studies on decision and judgmental processes, . . . on human intellectual limitations, . . . on risk attitudes and perceptions, . . . on factors contributing to conflicts and disputes about hazardous technologies and activities, . . . on factors influencing forecasts and judgments by experts, . . . on public preferences for decisionmaking processes, . . . on public responses to technological hazards, and case studies applying principles and methods from the psychological and decision sciences in specific settings" (p. v).

For those trained in the biological and environmental sciences this book will provide a number of new insights into the public's perceptions of environmental concerns, technology and risk, and into the methods used by decision-makers who must translate scientific knowledge into policy. Both the public and decision-makers are shown to be predictably frustrated by scientists' inability to provide

definitive, quantitative answers to questions of risk and environmental impact assessment. Perceptions of risk are often more emotional than logical, and the framing of information has substantial influence on perceived risk.

A great deal of new information and viewpoints are presented, but the book has several of the pitfalls characteristic of so many symposium volumes. We are presented, for example, with a variety of treatments of risk perception. Each provides some new information, but many of the same points are made over and over again. Inevitably there are wide discrepancies in the quality of the writing. The 37 papers range from turgid collections of jargon to clear, concise presentations illustrated with excellent examples. Richard Thaler's paper, "Illusions and Mirages in Public Policy," is an outstanding example of the latter. It is somewhat daunting to pick one's way through the 1068 pages of text in order to find the valuable information that does exist in these proceedings. While selected papers would be enlightening reading for both students and professionals in the environmental sciences, the book as a whole will probably be of value to a rather narrow audience of experts. The subject matter would be well covered by reading of one or two papers from each main section. In addition to Thaler's paper, contributions by Covello, Einhorn and Hogarth, and Edwards and von Winterfeldt are particularly informative and well written. Perhaps the wisest course of action is to recommend that your library purchase a copy.

Finally, the editors should be ashamed of the unfortunately poor quality of production of this book. Typographical errors are numerous and make some of the examples useless. Figures are at times mislabeled or even unlabeled. The quality of reproduction of some figures is so poor as to make them illegible. One paper was entirely lacking a list of references, although several were mentioned in the body of the text. There was certainly ample time to find and correct these errors; two years elapsed between the time of the symposium and the publication of this volume. Readers who invest in this rather expensive volume deserve better.

ROBIN CORT, *Engineering-Science, Inc., Berkeley, California*

A THEORY OF TECHNOLOGY. *Continuity and Change in Human Development.*

By Thomas R. DeGregori. The Iowa State University Press, Ames (Iowa). \$17.50 (paper). xiii + 263 p.; ill.; author and subject indexes. 1985.

DeGregori attempts to "generate a clear, coherent, consistent definition of technology and then to apply this conceptualization to the issues of technology and society" (p. xi). Technology or human tool-using, according to DeGregori, is a problem-solving

activity that involves "the use of ideas to transform the material and nonmaterial world" (p. 35). He sets forth 30 principles of technology that he contends "do not tell us what technologies to use [but rather] the kinds of questions we should ask in order to select the best technologies and obtain maximum benefit from them" (p. xii). DeGregori champions the thesis that life in general and human life in particular have evolved, not merely by living within limits, but by overcoming them, and that the technological enterprise that creates resources should be viewed as part of this process.

Whereas DeGregori readily admits that new technologies create new problems while solving old ones, he contends that technological progress has occurred because the new problems created by the technology are less harmful to the human enterprise than those solved. Ecological pessimists, in contrast to technological optimists such as DeGregori, contend that some of what is now called technological progress will be called ecological disaster when the long-term consequences of using the technology and future technologies are taken into account.

The basic issue of "whether our current practices are not only expandable, but more important, sustainable" (p. 112) is only briefly discussed by DeGregori, whose major thesis is that the solution to the problems created by technology is more technology. DeGregori goes so far as to argue that if the cruel choices outlined in the scenarios of the ecologists Hardin and Ehrlich come true it will be due to the lack of technology (p. 218). I view this one-sided emphasis on technology as the solution to our problems as a major shortcoming of this book.

DeGregori fails in his stated goal of ascertaining the kinds of questions we should ask in order to select the appropriate technologies for achieving improved and sustainable lifestyles. Biologists and others concerned with the development and use of appropriate sustainable technologies for improving and maintaining the quality of human life will find the guidelines for making decisions developed by Garrett Hardin in his 1985 book *Filters Against Folly* to be far more helpful than any guidelines found in *A Theory of Technology*.

CARL JAY BAJEMA, *Biology, Grand Valley State College, Allendale, Michigan*

KEY ENVIRONMENTS: ANTARCTICA.

Edited by W. N. Bonner and D. W. H. Walton; General Editor: J. E. Treherne; Foreword by HRH The Duke of Edinburgh. Published in collaboration with the International Union for Conservation of Nature and Natural Resources by Pergamon Press, Oxford and New York.

\$23.50. x + 386 p.; ill.; index. 1985.

It is especially appropriate that "the last place on earth" should be included in this series published in collaboration with the IUCN. Unfortunately, this

remote and harsh environment is under threat. The great whales are reduced to virtual extinction, krill are being harvested, and economic development is a possibility. The difficulty of access, the high costs of working in the cold, dry climate, and the lack of known, rich mineral resources combine to inhibit exploitation and to provide time to ensure that one of the goals of the Antarctic Treaty, to preserve Antarctica for scientific research, will be realized. But scientists themselves represent a threat; the fragile environment is slowly but surely becoming contaminated with the effluvia of a technical civilization. This problem of conservation and exploration is explored in the final chapter of this book.

The other 22 chapters are grouped into 7 major themes: history and exploration in antarctic biology; physical geography, including climate, geological evolution, and soils; terrestrial habitats, with descriptions of vegetation, invertebrates, and inland waters; marine habitats, describing plankton, benthos, fish, and cephalopods; birds and mammals, discussing seals, whales, oceanic birds, and penguins; the sub-antarctic islands; and food webs and interactions. Antarctica, defined as the area south of the Antarctic Convergence, the area in which Antarctic upper cold water sinks and mixes with the warmer sub-Antarctic surface water, includes many islands where vegetation and freshwater communities are more extensive and diverse than those on the continent. Terrestrial habitats are invertebrate habitats; the vertebrates are marine. The marine benthos lacks brachyuran crabs but has marvelous, giant isopods; brood protection is widespread.

The book is primarily descriptive; I would have liked much more discussion of the physiological ecology of antarctic organisms and a greater treatment of antarctic biota in relation to ecological theory, such as life history tactics. But the purpose of this book is to describe the environment and it admirably achieves its goal. The information is extensive, fascinating, and well illustrated. There is much that is useful for general ecology classes. Certainly anyone interested in antarctic research must start with this book.

KENNETH B. ARMITAGE, *Systematics & Ecology, University of Kansas, Lawrence, Kansas*

THE STATE OF THE WORLD'S PARKS. *An International Assessment for Resource Management, Policy, and Research.*

By Gary E. Machlis and David L. Tichnell; Foreword by Hal K. Eidsvik. Westview Press, Boulder (Colorado). \$28.85. xv + 131 p.; ill.; index. 1985.

It is a common practice among conservationists and others to measure the "environmental consciousness" of a country by the percentage of its land area that is set aside in the form of national parks or other types of reserves. This is equated by many people to the minimum area preserved in perpetuity for