MAN, NATURE AND TECHNOLOGY

Also by Erik Baark

INDIA-CHINA COMPARATIVE RESEARCH (*editor with Jon Sigurdson*)

*TECHNOLOGICAL DEVELOPMENT IN CHINA, INDIA AND JAPAN (*editor with Andrew Jamison*)

Also by Uno Svedin

RESOURCES, SOCIETY AND THE FUTURE (*co-author*)

METHODS IN FUTURES STUDIES – PROBLEMS AND APPLICATIONS (*with B. Schwarz and B. Wittrock*)

NATURE AS A SYMBOL (*in Swedish*)

EARTH – MAN – HEAVEN (*in Swedish*)

**Also published by Macmillan*

Man, Nature and Technology

Essays on the Role of Ideological Perceptions

Edited by

Erik Baark

*Research Fellow
Research Policy Institute
University of Lund*

and

Uno Svedin

*Executive Secretary
Committee for Natural Resources Research
Swedish Council for Planning and Coordination of Research*

Foreword by **Torsten Hägerstrand**

Chairman of SALFO, 1974–85

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Softcover reprint of the hardcover 1st edition 1988 978-0-333-42812-2

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First published 1988

Published by

THE MACMILLAN PRESS LTD

Houndmills, Basingstoke, Hampshire RG21 2XS

and London

Companies and representatives
throughout the world

Typeset by Wessex Typesetters

(Division of The Eastern Press Ltd)

Frome, Somerset

British Library Cataloguing in Publication Data

Man, nature and technology: essays on the
role of ideological perceptions.

1. Technology—Philosophy

I. Baark, Erik II. Svedin, Uno

601 T14

ISBN 978-1-349-09089-1 ISBN 978-1-349-09087-7 (eBook)

DOI 10.1007/978-1-349-09087-7

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Foreword

If human culture from its very beginning had been uniformly the same everywhere, it would have been extremely hard to discern. We discover culture when we experience world-views and ways of life which differ between continents and regions. The individuality of a culture is the outcome of an historical process, rooted in the characteristics of the physical environment, coloured by a unique position in the global flow of ideas, and protected by a certain amount of isolation. The permeable barrier around a culture is of particular significance. A completely isolated group lacks the stimulus of communication. But without some protection the individuality is gradually eroded. In today's world of instant information and global circulation of goods, language is perhaps the only remaining membrane which simultaneously separates and connects.

The sciences and the science-based technologies have developed their own set of cultural identities, each of which uses a language of its own. In this respect we find a striking similarity with cultural development in general. But there is also a fundamental difference. Our everyday taken-for-granted culture is parochial. It reflects the experiences of people in their historically established environments. The scientific cultures, on the other hand, claim to be global in nature. They divide the world into uniform strata of standardised concepts.

Today's world is permeated by a strong interaction between the two forms of culture. Each form affects the other, but neither is likely to become totally dominant. There is far too much in human life which cannot – or should not – become subsumed into the rules of scientific cultures. And, in fact, science and technology are by no means so independent of historically established cultural circumstances as their spokesmen like to believe.

Since the use of natural resources is a human necessity, every historical culture has developed its own ideas of nature. Clearly, the spread of a scientific mode of thinking and acting will profoundly influence these ideas and, to a certain extent, be affected by them. One of the problematic outcomes of the shift towards globalisation of concepts and practical standards is that people will have less and less opportunity to see for themselves the consequences in nature of their actions. In former days when redistribution of matter was less

extensive, nature could, so to speak, send back messages to the inhabitants of an area and thereby modify their outlook and behaviour. The emerging situation makes the loops of cause and effect increasingly indistinct and incomprehensible. Systematic monitoring, of course, can help to a certain extent. But an enduring problem will be that our institutions for decision-making and control are inherited from the local cultures and not easily adapted to interrelations of global dimensions.

The considerations just exemplified – many of which are particularly relevant for a small country – caused the Committee for Future Oriented Research (SALFO) at the Swedish Council for Planning and Coordination of Research (FRN) to launch a programme composed of a series of trans-disciplinary studies of the complex relations that exist between culture, nature and technology. The approach has been historical as well as comparative. In the course of this work the Swedish researchers have had the advantage of inspiration from many colleagues outside Sweden. In order to make some of the contributions of this group more generally available the Committee asked Dr Uno Svedin (co-ordinator of the project 'Natural resources in a cultural perspective') and Dr Erik Baark (co-ordinator of the project 'Technology and culture') to promote a synthesis by assembling and commenting upon a collection of essays dealing with the role of ideology in the developments within the culture–nature–technology triangle. Thanks are due to the authors of the essays for their generous collaboration and to the two project leaders and editors for their dedicated work over several years.

Lund

TORSTEN HÄGERSTRAND
Chairman of SALFO, 1974–85

Notes on the Contributors

Erik Baark is Research Fellow at the Research Policy Institute, University of Lund, Sweden. His main interest has been research on the conditioning of technological development in non-Western countries, in particular China, Japan and India. He believes that research on these processes of accommodating technological change to the specific social and cultural characteristics obtaining is important for the study of technology in relation to human history. Taking a special interest in the development and use of information technologies, he believes that differences in patterns of exchange and processing of information arise from, and at the same time condition, the development of modern society. His publications include *India-China Comparative Research* (1981) which he edited with Jon Sigurdson, and *Technological Development in China, India and Japan* (1986) which he edited with Andrew Jamison.

Robert W. Kates is a geographer and is currently University Professor and Director of the Alan Shawn Feinstein World Hunger Program at Brown University, Providence, Rhode Island, USA. He is the author of papers, books and monographs on geophysical and technological hazards; landscape perception; water resources and rural development, particularly in Africa; he has also helped develop the methodologies of environmental perception, risk assessment, and climate impact assessment. The paper presented in this volume derives from his long-term interest in theories of human environment. This theoretical work is complemented by a series of current empirical studies dealing with long-term human environmental experience on scales of centuries and millenia. Specifically these include studies of fluctuations in human population, the last three hundred years of human-induced earth transformation, and the identification of potential limits, if any, to the sustainable development of the biosphere over the next century. His publications include many papers related to the human environment, and the joint-editorship of *Perilous Progress: Technology as Hazard* (1985).

David Lowenthal is Professor of the Department of Geography, University College, London, United Kingdom. He has long had active links with crusades for conserving both nature and antiquities,

our physical and our cultural heritage. Since the 1950s he has been involved with such organisations as the Conservation Foundation, Resources for the Future, the International Council on Monuments and Sites, Save Britain's Heritage, and the Caribbean Conservation Association. Yet his major concern is less with saving things than with trying to understand the history of impulses to conserve, the background of historical and ecological understanding, and the motivations that fuel these crusades. These interests are embodied in his publications, which include the biography of the pioneer American conservationist Marsh, *George Perkins Marsh: Versatile Vermonter* (1958), the edition of Marsh's 1864 classic, *Man and Nature* (1965), and his two recent books on historical heritage, *Our Past Before Us: Why Do We Save It?* (1981) and *The Past Is a Foreign Country* (1985).

Francisco R. Sagasti is Director of the Grupo de Analisis para el Desarrollo (GRADE), Lima, Peru. His initial professional and intellectual interests centred upon the use of management science and operations research in development planning and management. During the last fifteen years he has worked in the field of science and technology in developing countries, examining issues such as the historical evolution of science in Latin America, the science and technology policy design and implementation process in developing countries, and international collaboration in science and technology. He has been one of the key researchers in the 'Science and Technology Policy Indicators' project which was initiated by the Science Policy Research Unit, Sussex University, United Kingdom. He was also deeply involved in the debates which were associated with the United Nations Conference on Science and Technology for Development, convened in Vienna in 1979. His more recent work has focussed on the problem of identifying and designing development options and strategies, seeking to develop new approaches and methods for long-term planning in developing countries. Simultaneously, his interests are shifting towards providing an integrated perspective of the role of modern science and technology in the process of development, a concern which is reflected in his contribution to this volume. He has published fourteen books and monographs and more than one hundred papers, most of which relate to science and technology for development.

Uno Svedin is Executive Secretary of the Committee for Research

on Natural Resources at the Swedish Council for Planning and Coordination of Research. He was trained as a physicist and holds a doctorate in physics at the University of Stockholm. He later specialised in technology assessment and natural resources issues and was a member of the project group on 'Resources and Raw Materials' at the Secretariat for Futures Studies during the 1970s. The final report 'Resources, Society and the Future' was published in 1980 in its English version by Pergamon. Svedin was responsible for the preparation of the Swedish National Report to the 1979 UN Conference on Science and Technology for Development (UNCSTD). His interests include methods of futures studies (he has published *Methods in Futures Studies – Problems and Applications*, 1983, together with B. Schwarz and B. Wittrock), technology assessment and environmental perception. Books (in Swedish) include *Nature as a Symbol*, 1983, and *Earth – Man – Heaven*, a few scholars' views of Nature as presented in the major cultures of the world.

Michael Thompson is Principal Research Fellow, Institute for Management Research and Development, University of Warwick, and Technology Policy Unit, University of Aston, United Kingdom. He is an anthropologist by training and applied systems analyst (or policy analyst) by occupation. Over the last ten years or so he has been engaged in a programme of interdisciplinary, international and often collaborative research, his feeling being that if anthropology is indeed the queen of social sciences, it should have something valuable to contribute to our understanding of technology, information, organisation, management and leadership. It should contribute to the whole business of policy formation and policy viability, and to the economics and aesthetics of social life ancient *and* modern (and post-modern). He has worked on substantive issues in a wide range of policy areas: environmental policy, social policy, energy policy, technology policy and (most recently of all) industrial and business policy. At the same time, he has worked to harness all this applied research to the parallel development of the broad theoretical framework which, in his view, anthropology alone can provide. As a leader of the Core Concepts Project at the International Institute for Applied Systems Analysis (IIASA), he has worked to develop and communicate this framework, components of which are also presented in his contribution to this volume. His publications include *Rubbish Theory: The Creation and Destruction of Value* (1979) and many

papers and articles exploring the cultural dimensions of risk, policy-making, and so on.

Donald Worster is Jack E. Meyerhoff Professor of American Environmental Studies, Brandeis University, USA. He has primarily been interested in the new field of environmental and ecological history – that is, history viewed from an ecological perspective. For a long while historians have tended to treat human history as though it had nothing to do with the earth and its processes. Worster calls for a perspective which sees the fate of societies as dependent on such natural variables as climate, soil, vegetation, ecosystems, the carbon cycle and the like. People should realise too that what humans do to the earth can have serious adverse consequences, for the earth as well as for the people. This is an important theme in American social history, but today it has world-wide significance, as marginal lands around the globe are being exploited, often by market-oriented developers, and desertification has become an international problem. Worster's publications include the recent analysis of issues similar to those covered in the chapter presented in this volume, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (1986). He has also published *Nature's Economy: A History of Ecological Ideas* (1985; orig. publ. 1977) and *Dust Bowl: The Southern Plains in the 1930s* (1979).

Brian Wynne is Reader in Science Studies, and Director of the Centre for Science Studies and Science Policy, at the University of Lancaster, United Kingdom. Originally a materials scientist, he has taught and researched on the social aspects of science and technology since 1974. In 1977 he took part as a lay advocate in the Windscale nuclear plant Public Inquiry, and later wrote a book about it, *Rationality and Ritual: the Windscale Inquiry and Nuclear Decisions in Britain* (1982), which was described by Alvin Weinberg, elder statesman of nuclear energy and United States science policy, as brilliant, but marred by an anti-nuclear tone! In 1983–4 Brian Wynne led a research group on Institutional Settings and Environmental Policies at the International Institute for Applied Systems Analysis (IIASA), Austria, where he worked closely with Michael Thompson. Several publications have appeared from this project, including a special issue of *Policy Sciences* (December 1984) on technical and institutional problems in global energy modelling. Apart from the above-mentioned book on the

Windscale inquiry, his publications include the report from IIASA, *Hazardous Management of Wastes: Implementation and the Dialectics of Credibility* (1987).