Technology Assessment: Creative Futures

Perspectives From and Beyond
the Second International Congress

Series Volume 5

Prepared by
Mark A. Boroush
Kan Chen

and
Alexander N. Christakis

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Prepared by
Mark A. Boroush
Kan Chen
The University of Michigan
and
Alexander N. Christakis
University of Virginia

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Preface

The contents of this volume are largely based upon and stimulated by the presentations and discussions that took place during the Second International Congress on Technology Assessment held at the University of Michigan in Ann Arbor on October 24–28, 1976. Our book project started as an effort to summarize and interpret the principal contributions of the various sessions at the Congress. As we took the time to attempt what we considered to be a sufficiently systematic, though inevitably subjective, synopsis of the critical issues, the international perspectives, and the emerging paradigm of technology assessment, we could not avoid drawing extensively from the new ideas and discussions that have surfaced since the Congress. Thus this volume contains many references, as well as reflections of ours, from the period since that event.

The Second International Congress sponsored by the International Society for Technology Assessment (ISTA) was designed explicitly to provide the opportunity for extended discussions of the conceptual and substantive aspects of the practice of technology assessment (TA). The many viewpoints and perspectives that were present during the 1976 Congress—spanning many disciplines, sectors of society, and countries—pointed dramatically to the interest that had arisen in the critical examination of technological innovations and their interactions with societal functions. However, the diversity of outlooks and perspectives present evidenced significant differences in opinion as to

how best to put the TA outlook into practice. Despite the several years that now have passed, the issues that assumed so much importance then still remain cogent and timely for the contemporary field of TA.

This volume is divided into three parts. Part I provides an introduction to the issues that currently dominate the practice of TA. Part II organizes many of the presentations and discussions of the Second International Congress centered around the themes of TA and planning, the institutional roles TA has assumed, and the development of TA methods. Part III is comprised of several of our own essays which seek to provide the TA synopsis mentioned previously. Thus, the third part incorporates not only our experiences of the Second International Congress, but also the major developments in the following year. These include, among others, the Conference on Retrospective TA held near Pittsburgh, Pennsylvania in December 1976; the East–West Center Conference on TA held at Honolulu, Hawaii during May 1977; and the International Institute for Applied Systems Analysis Workshop on TA held in Laxenburg, Austria in July 1977.

The intended audience of this volume is the TA community, which now spans the academic, government, and industrial sectors throughout the world. To interested observers and students who are trying to think more clearly and creatively about the interfaces of technologies and society, the present volume should serve as a compendium of the ideas that currently constitute the major themes of technology assessment and as stimulating reading materials that complement and supplement any basic TA text or primer. Importantly, it is addressed to those who seek to create alternative futures in the context of contemporary reality. Ten years ago, not many people were interested in the interactions of technology with society; only a few could see the signs of the impending problems; most were not even aware of the importance of our technological choices. Today, many people are asking to participate in creating the future by assessing our technological options.

The three authors/editors have collaborated in every way to make this volume a joint undertaking. By and large, however, Christakis has been primarily responsible for organizing the program of the Second International Congress, for originating the idea of preparing this book, and for drafting Part I; Boroush, for organizing Part II on the basis of the presentations and dialogues that took place at the Second International Congress and for assuming overall coordination of the

preparation of this volume; and Chen, for drafting most of Part III during his sabbatical leave from the University of Michigan.

Mark Boroush
Kan Chen
Alexander N. Christakis

Foreword

Over 10 years have elapsed since former Congressman Emilio Daddario introduced legislation that led to the establishment of the Office of Technology Assessment in the U.S. Congress and to worldwide interest in technology assessment. During this period, hundreds of technology assessment projects of various sizes have been completed in many countries by government, industry, research institutions, and the academic community. A great variety of approaches to technology assessment has been taken in these projects. The diversity of approaches is paralleled by the diversity of ideas about how technology assessment can be further improved. Many of these ideas were expressed at the Second International Congress on Technology Assessment and in several subsequent documents. This book, by Mark Boroush, Kan Chen, and Alexander Christakis, is worthy of careful attention because it provides both a clear articulation of these diverse ideas and a coherent organization for them.

In addition, the authors have indicated a new direction for the next generation of technology assessments. This new direction, which they call an emerging TA paradigm, merits serious consideration because it is responsive to significant gaps and concerns in the technology assessment field. These include concern for individuals today and for the quality of life of our children and grandchildren, whose welfare has too often been eclipsed by short-term disputes and conflicts among institutions and interest groups. Said another way, the new ap-

proach gives added attention to the use of technology for creating a desirable long-range future rather than simply providing technological fixes to immediately pressing problems.

Equally important in the new direction is citizen involvement, which can bridge the gap between factual technical analysis and value-oriented policy analysis. Many have sounded the call for a holistic and global paradigm for technology assessment so that we may deal adequately with these concerns. However, few have suggested specific instruments and concrete ways, as the authors of this book have done, to put such an approach into practice. It is these elements for implementation, as well as the philosophical discourse on the emerging paradigm, that make this book particularly interesting to the TA community.

Gov. Russell W. Peterson
President
National Audobon Society
Former Director
U.S. Office of Technology Assessment

Contents

List of Contributors

Note: Page numbers are given in parentheses.

Andelin, John
Consultant, Washington, D.C. (295)

Antonorsi-Blanco, Marcel
Instituto de Estudios Superiores de Administracion (IESA), Venezuela (186)

Appleton, David
TRW, Redondo Beach, California (122)

Armstrong, John
Dept of Civil Engineering, University of Michigan, Ann Arbor, Michigan (189)

Arnold, Henry A.
Office of Science and Technology, Technical Assistance Bureau, AID, U.S. Department of State, Washington, D.C. (189)

Arnstein, Sherry R.
National Health Council, Washington, D.C. (42, 85)

Benson, James
Council on Economic Priorities, New York, New York (134)

Berg, Mark
Institute for Social Research, University of Michigan, Ann Arbor, Michigan (276)

Carrere, Maximo Halty
Consultant, Montevideo, Uruguay (189)

Christakis, Alexander N.
University of Virginia, Charlottesville, Virginia (71, 203)

Coates, Vary
Consultant, Washington, D.C. (67)

Day, Lawrence
The Diebold Group, New York, New York (122)

Dodoo, Robert, Jr.
Council for Scientific and Industrial Research, Accra, Ghana (189)

Flajser, Steven H.
U.S. Senate Commerce Committee Staff, Washington, D.C. (85)

Ganapathy, R.S.
Urban and Regional Planning Program, University of Michigan, Ann Arbor, Michigan (185, 189)

Gerardin, Lucien A.
Thomson CSF, Paris, France (221)

Gilgun, Jorge
United Nations Industrial Development Organization, Vienna, Austria (139)

Henderson, Hazel
Author, Gainesville, Florida (29)

Jarboe, Kenan
Program in Technology Assessment, University of Michigan, Ann Arbor, Michigan (134)

Jessen, Peter J.
Rutgers University, New Brunswick, New Jersey (241)

Kaje, Ritva
University of California, Riverside, California (152)

Kaufmann, Felix
Consultant, Ann Arbor, Michigan (122)

Kawamura, Kazuhiko
Battelle Columbus Laboratories, Columbus, Ohio (203)

Kelly, Edward T.
National Science Foundation, Washington, D.C. (117)

Kennerly, John
United Nations, New York, New York (37, 193)

Krampe, Gerd
Battelle Institute, Frankfurt, Federal Republic of Germany (231)

Kranzberg, Melvin
Dept. of Social Sciences, Georgia Institute of Technology, Atlanta, Georgia (24)

Lee, Rensselaer
Mathematica Corporation, Bethesda, Maryland (170)

Maimon, Steven R.
Consultant, Washington, D.C. (123)

Maloney, James D., Jr.
Midwest Research Institute, Kansas City, Missouri (124)

Michael, Donald
Institute for Social Research, University of Michigan, Ann Arbor, Michigan (59)

Miller, Dennis F.
Subcommittee on Energy and Environment, U.S. Congress, Washington, D.C. (111)

Miller, Peter D.
Standford Research Institute, Menlo Park, California (260)

Mosher, Charles A.
George Washington University, Washington, D.C. (107)

Mottur, Ellis
U.S. Office of Technology Assessment, Washington, D.C. (133)

Nockharashy, Ahmed S.
Academy of Science Research and Technology, Cairo, Egypt (189)

Oksenberg, Michael
National Security Council, Washington, D.C. (183)

Ovcharenko, Valeriy A.
United Nations, New York, New York (37, 193)

Paschen, Herbert
Institut für Angewandte Systemanalyse, Karlsruhe, Federal Republic of Germany (141, 149)

Plotkin, Steven
U.S. Office of Technology Assessment, Washington, D.C. (299)

Porter, Alan L.
School of Industrial Systems Engineering, Georgia Institute of Technology, Atlanta, Georgia (81)

Rich, Robert F.
Woodrow Wilson School of Public and International Affairs, Princeton University, Princeton, New Jersey (276)

Roper, A. T.
Center for Technology Assessment, Rose-Hulman Institute of Technology, Terre Haute, Indiana (39)

Rossini, Frederick A.
Department of Social Science, Georgia Institute of Technology, Atlanta, Georgia (81)

Sauber, William
Dow Chemical Co., Midland, Michigan (123)

Shibata, Yusaku
Hitachi, Ltd., Tokyo, Japan (156)

Skolimowski, Henryk
University of Michigan, Ann Arbor, Michigan (86)

Strain, Gustave
Embassy of France, Washington, D.C. (147)

Sullivan, James B.
National Council for the Public Assessment of Technology, Washington, D.C. (132)

Vlachos, Evan
Colorado State University, Fort Collins, Colorado (85, 136)

Wharton, Fred
Monsanto Corporation, St. Louis, Missouri (123)

Zacher, Lech
Polish Academy of Sciences, Institute of Philosophy and Sociology, Warsaw, Poland (161)

I

INTRODUCTION

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Beyond Prometheus and Sisyphus: Technology and Technology Assessment in the Contemporary World

No one seriously doubts the major role that decades of technological innovation have played in shaping the modern world—its living standards, its spatial features, and its biosphere. Few visions of responses to the challenges of the future do not in some fundamental way depend upon the growth and diversification of technologies. Yet it has become clearer to an ever increasing group of people throughout the world—social critics, citizens, political leaders, members of the scientific community—that technological progress and innovation often contain contrasting potentials. It can and has enabled rapid gains in social and cultural progress, on the one hand; it can and has engendered social dysfunction, on the other.

One does not have to look far afield to find examples of either of these outcomes. Modern synthetic chemistry has been the source of a variety of "staples," e.g., plastics, solvents, pharmaceuticals, and agricultural pesticides, that have become instrumental to the well-being of contemporary industrialized economies. Yet recent events continue to reveal that the residuals of some of these products—sometimes, indeed, the products themselves—have been major pollution vectors whose accumulation pose grave threats to the health of humans and ecosystems. The availability of the automobile has provided many generations in the industrialized world with what earlier periods would have regarded to be unimaginable mobil-

ity. It has probably contributed heavily to the removal of a variety of cultural barriers buttressed by views of the world shaped solely by parochial local experiences. Yet, in addition to pollution and highway safety problems, its instrumental role in providing the capacity for "suburban flight" has also made it a significant factor in the decay and financial decline that have become realities for many contemporary urban centers. Similarly, the computer revolution has provided society with capacities to deal with the nuances of its complex environment with far greater dexterity. It promises to be a resource for the development of a wide range of labor-enhancing devices. Yet the information processing capacity that it implies could well function as a major underpinning of a society that becomes considerably more authoritarian.

Many other examples could be found. Those mentioned here have only been touched at their surfaces. Yet it becomes clear that technologies cannot be divorced from their longer-term and systemic streams of impacts. Few technologies are likely to be characterized only by entries in the "benefits" column; likewise, equally few are likely to be characterized by entries solely in the "costs" column. Management is invariably faced with the problem of choosing among outcome streams rife with cost–benefit trade-offs. In the same way, the contemporary issue over technology development and deployment has become a similar question of wise management relative to encompassing social goals.

CONTEMPORARY TECHNOLOGICAL DECISION MAKING

Many industrialized societies, such as the United States, Japan, the Federal Republic of Germany, Sweden, France, and others, have become increasingly aware that many of their modern technologies, although originally generating *positive* short-term results for parts of the whole society, are now giving rise to a host of *negative* consequences in the longer run—as represented by such contemporary problems as environmental pollution, depletion of nonrenewable resources, elimination of cultural diversity, worker alienation, and structural unemployment. Many of these problems can be traced to the overly simplistic (at least from a systemic point of view) criteria that guided the technological and economic decisions of the 1950s and 1960s, namely, Can we do it? Can we sell or market it? Is it safe? The outcomes of today suggest rather clearly that much remained to be understood about these questions and the answers that were accepted.

Since the early 1970s, citizens, decision makers, and policy makers have become increasingly aware that many issues that used to be