

RESOURCE RECOVERY AND UTILIZATION

*Proceedings of the
National Materials
Conservation Symposium*

Alter/Horowitz

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AMERICAN SOCIETY FOR TESTING AND MATERIALS

RESOURCE RECOVERY AND UTILIZATION

Proceedings of the
National Materials
Conservation Symposium

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Bureau of Mines
Environmental Protection Agency
National Center for Resource Recovery, Inc.
American Society for Testing and Materials

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Gaithersburg, Md., 29 April-1 May 1974

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Foreword

The National Materials Conservation Symposium on Resource Recovery and Utilization was held 29 April-1 May 1974 at the National Bureau of Standards in Gaithersburg, Md. The symposium was sponsored by: National Bureau of Standards; Bureau of Mines; Environmental Protection Agency; National Center for Resource Recovery, Inc.; and American Society for Testing and Materials. Harvey Alter, National Center for Resource Recovery, Inc., and Emanuel Horowitz, National Bureau of Standards, served as the symposium cochairmen.

Related ASTM Publications

Water Quality Parameters, STP 573 (1975), \$29.50, 04-573000-16

Disposal of Plastics With Minimum Environmental Impact, STP 533
(1973), \$4.25, 04-533000-19

Preface

There is renewed and increasing interest in the conservation of materials and the reuse of our discards as the nation seemingly turns to a conservation ethic. Congress declared as national policy "...to enhance environmental quality and conserve materials by developing a national materials policy to utilize present resources and technology more efficiently...".¹ Prestigious learned groups continue to stress the total materials cycle,² emphasizing recycling as a means of closing the utilization loop between the world's finite resources and continued necessary consumption. Reported reserves of some ores are frighteningly limited.³ Even if such reports merely reflect a degree of ignorance of the one percent or so of the earth's crust which has been explored and exploited, there are, nonetheless, environmental, social, and other costs⁴ which must be factored in any weighing of consumption versus conservation or alternative strategies.

Domestic life style since World War II has been characterized as a "throw-away society." Materials and energy costs were such that often it was cheaper to discard rather than recover, repair, or reuse. "Externalities" of environmental insult or conservation of natural resources were not "internalized" in the costs of goods and related services. The success of this behavior and the attendant expansion of the economy in bringing materialistic benefits to great numbers of people in a remarkably short time led some to the false security of believing in cornucopianism. It was the growth and questioning of this philosophy that fostered counter-views which range from predictors of doomsday⁵ to the more moderate, now well-known limits to growth.⁶ Or, perhaps there is something in-between.⁴

The concepts of conservation and recycling as part of the total materials cycle are not new. Serious study of the means of achieving both is not recent⁷ but has gained recent impetus. ^{2,3} Materials conservation as a national policy has been put forth clearly and firmly that "...a national resource recovery system be established..."^{3,7} The organizing committee of this symposium

¹Public Law 91-512, 91st Congress, H.R. 11833, Title II—National Materials Policy, Sec. 202, 26 Oct. 1970.

²"Materials and Man's Needs. Materials Science and Engineering," Summary Report of the Committee on the Survey of Materials Science and Engineering, National Academy of Sciences, Washington, 1974.

³"Material Needs and the Environment Today and Tomorrow," Final Report of The National Commission on Materials Policy, Washington, 1973.

⁴Brooks, D. B. and Andrews, P. W., *Science*, Vol. 185, 1974, p. 13.

⁵For a critique of such philosophies, see Maddox, J., *The Doomsday Syndrome*, McGraw-Hill, New York, 1972 or Cole, H. S. D., et al, Eds., *Models of Doom: A Critique to Limits to Growth*, Universe Books, New York, 1973.

⁶Meadows, D. H., Meadows, D. L., Randers, J., and Behrens, W. H., III, *The Limits to Growth*, Signet, New York, 1972.

⁷"Resources for Freedom," Report of the Paley Commission on Materials Policy, Washington, 1952.

convened, ad hoc and at its own initiative, with the hope and goal of providing a permanent forum for discussion and implementation of such policy through continuing symposia.

This symposium addresses one strategy for conservation, that of resource recovery and utilization of the recovered materials in commerce. By definition almost, there cannot be the former without the latter,⁸ although, this is sometimes overlooked. There are important relationships involving the properties of materials, characterization, classification, and the technologies required for the recovery and utilization of the materials derived from wastes. Both technical and nontechnical factors affecting the implementation of resource recovery and reuse were addressed by the participants. The contributed papers dealt little with economic factors which are important, but covered elsewhere.⁹ The program was arranged to give special emphasis to the oft ignored interface between recovery and use technologies. Five classes of materials likely to be recovered are discussed: paper and paperboard, ferrous metals, nonferrous metals, glass, and plastics.

The symposium was organized to include day-long concurrent workshops to discuss how recovery technology and current use practices for the recovered materials may be brought closer together. Readers are directed to the charge given the workshops and their excellent reports in response.

The editors point out that many of the written versions of the presentations differ from the scholarly literature of related fields in that the papers presented here are not replete with citations of earlier work. We think this is significant. Resource recovery from municipal wastes is now just entering the maturity of its own literature. We hope these published proceedings will advance the process.

This symposium was organized by a committee consisting of: Clarence A. Clemons, U.S. Environmental Protection Agency, Cincinnati; J. Nicholas Humber, U.S. Environmental Protection Agency, Washington; Charles B. Kenahan, U.S. Bureau of Mines, College Park; and Earl Sullivan, ASTM Staff Liaison, who gave of their time and professional abilities along with the editors. We gratefully acknowledge the assistance of the staff at the National Bureau of Standards for their capable preparation of the symposium facilities and related activities.

Harvey Alter

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⁸Alter, H., *Solid Wastes Management/RRJ*, Vol. 17, No. 10, Oct. 1974, p. 8.

⁹Abert, J. G., Alter, H., and Bernheisel, J. F., *Science*, Vol. 183, 1974, p. 1052.

A Note of Appreciation to Reviewers

This publication is made possible by the authors and, also, the unheralded efforts of the reviewers. This body of technical experts whose dedication, sacrifice of time and effort, and collective wisdom in reviewing the papers must be acknowledged. The quality level of ASTM publications is a direct function of their respected opinions. On behalf of ASTM we acknowledge with appreciation their contribution.

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