

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Editorial Board

1976

ALFRED E. BROWN	FRANK PRESS
JAMES F. CROW	FRANK W. PUTNAM
HANS LANDSBERG	MAXINE SINGER
EDWARD NEY	ARTHUR M. SQUIRES

1977

WARD GOODENOUGH	DONALD KENNEDY
CLIFFORD GROBSTEIN	NEAL E. MILLER
H. S. GUTOWSKY	RAYMOND H. THOMPSON
N. BRUCE HANNAY	

Editorial Staff

Editor

PHILIP H. ABELSON

Publisher

WILLIAM D. CAREY

Business Manager

HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

Assistant Editors: ELLEN E. MURPHY, JOHN E. RINGLE

Assistant to the Editors: RICHARD SEMIKLOSE

News and Comment: JOHN WALSH, *Editor*; PHILIP M. BOFFEY, LUTHER J. CARTER, BARBARA J. CULLITON, ROBERT GILLETTE (on sabbatical), CONSTANCE HOLDEN, DEBORAH SHAPLEY, NICHOLAS WADE. *Editorial Assistant*, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, WILLIAM D. METZ, THOMAS H. MAUGH II, JEAN L. MARX, ARTHUR L. ROBINSON, GINA BARI KOLATA, FANNIE GROOM

Book Reviews: KATHERINE LIVINGSTON, LYNN MANFIELD, JANET KEGG

Cover Editor: GRAYCE FINGER

Editorial Assistants: JOHN BAKER, ISABELLA BOULDIN, MARGARET BURESCH, ELEANORE BUTZ, MARY DORFMAN, SYLVIA EBERHART, JUDITH GIVELBER, CAITILIN GORDON, CORRINE HARRIS, NANCY HARTNAGEL, OLIVER HEATWOLE, CHRISTINE KARLIK, MARGARET LLOYD, JEAN ROCKWOOD, LEAH RYAN, LOIS SCHMITT, YA LI SWIGART, ELEANOR WARNER

Guide to Scientific Instruments: RICHARD SOMMER

Membership Recruitment: GWENDOLYN HUDDLE; *Subscription Records and Member Records:* ANN RAGLAND

Advertising Staff

Director

EARL J. SCHERAGO

Production Manager

MARGARET STERLING

Advertising Sales Manager: RICHARD L. CHARLES

Sales: New York, N.Y. 10036: Herbert L. Burkland, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 11 N. La Cienega Blvd. (213-657-2772); DORSET, VT. 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phones: (Area code 202) Central Office: 467-4350; Book Reviews: 467-4367; Business Office: 467-4411; Circulation: 467-4417; Guide to Scientific Instruments: 467-4480; News and Comment: 467-4430; Reprints and Permissions: 467-4483; Research News: 467-4321; Reviewing: 467-4443. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xi, *Science*, 26 September 1975. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Renewable and Nonrenewable Resources

The current issue of *Science*, devoted to materials, is the third in a series of special issues that have provided extensive discussion of topics of enduring consequence. The first two subjects treated were energy* and food*. How the various peoples deal with these three matters in the future will go far to shape their living patterns and their destinies. *Science* has also published a large number of individual articles on topics related to population. Many of these have been gathered together and republished in a compendium entitled *Population: Dynamics, Ethics, and Policy**.

In these publications the perspective is future-oriented, and one is given the benefit of the visions provided by about one hundred of America's leading scholars. Most readers, of course, will see or have seen in the articles reinforcement for already held beliefs, but few can peruse the total without encountering new ideas. In addition to covering scientific and technological aspects, the articles treat economic and political factors, including some international issues.

If we focus on the United States, the future picture at first sight looks favorable. The country has much in the way of potential energy sources, it is the major granary of the world, and it is well fixed with some, though not all, materials resources. It could fill reasonable future needs for energy, food, and materials while safeguarding the environment. Population increase goes on, but at not so dangerous a rate as in many other countries. If one concentrates on scientific and technological aspects, one can be quite optimistic. Until recently we have been quite wasteful with respect to energy and materials. It is now evident that many functions could be performed using half or less of the previous standard amounts of these items. In addition, as Chynoweth points out in this issue, we have not begun to exhaust the potentialities of electronics in conserving energy and materials.

But when one examines economic, political, and sociological aspects in relation to energy, food, materials, and population, the picture is not so bright. For example, science, medicine, and technology have provided a variety of contraceptive devices and methods. These can and will be improved and supplemented. But to what extent will they be used? Behavior of the government in handling energy matters has been disquieting. Can politicians, necessarily governed by a short-term vision, be depended on to make good long-term decisions in highly complex technological matters? The recent indication is that the answer is No! If we are to have anything approaching energy independence, huge investments must be made either by government or by industry. Congress is deathly afraid of passing legislation that might enable industry to make a profit from developing new energy sources, such as by liquefaction of coal, but at the same time Congress is reluctant to set up a government corporation to do the job.

In the materials field much new legislation has been enacted that has severely restricted the mining and processing of minerals. Our forests constitute one of the great potentials for materials for the future, but government has, if anything, impeded rather than facilitated constructive developments.

As for the other countries, their peoples face differing constraints and opportunities. To a considerable degree the world's knowledge is accessible to them. They differ, of course, in available resources, but there are few countries in which performance comes close to matching technological opportunities. This is true with respect to energy, food, and materials. It is especially true with respect to population control. Countries continue to experience a 3 percent annual population growth that guarantees future miseries. Some of these countries have been making increasingly strident demands on the developed countries, whose response to their requests has been diminishing. Many people would like to be helpful and constructive, but despair of a situation in which nations do little to help themselves. Science and technology hold great potentials for humanity, but they are not effective in the absence of appropriate institutional arrangements.—PHILIP H. ABELSON

*For further information see page 612.