

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

1978: RICHARD E. BALZHISER, JAMES F. CROW, HANS LANDSBERG, EDWARD NEY, FRANK W. PUTNAM, MAXINE SINGER, PAUL E. WAGGONER, F. KARL WILLENBROCK

1979: E. PETER GEIDUSCHEK, WARD GOODENOUGH, N. BRUCE HANNAY, MARTIN J. KLEIN, FRANKLIN A. LONG, NEAL E. MILLER, JEFFREY J. WINE

Publisher

WILLIAM D. CAREY

Editor

PHILIP H. ABELSON

Editorial Staff

Managing Editor

ROBERT V. ORMES

Assistant Managing Editor

JOHN E. RINGLE

Business Manager

HANS NUSSBAUM

Production Editor

ELLEN E. MURPHY

News and Comment: BARBARA J. CULLITON, *Editor*; LUTHER J. CARTER, CONSTANCE HOLDEN, DEBORAH SHAPLEY, R. JEFFREY SMITH, NICHOLAS WADE, JOHN WALSH. *Editorial Assistant*, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, *Editor*; RICHARD A. KERR, GINA BARI KOLATA, JEAN L. MARX, THOMAS H. MAUGH II, WILLIAM D. METZ, ARTHUR L. ROBINSON. *Editorial Assistant*, FANNIE GROOM

Associate Editors: ELEANORE BUTZ, MARY DORFMAN, SYLVIA EBERHART, JUDITH GOTTLIEB

Assistant Editors: CAITILIN GORDON, RUTH KULSTAD, LOIS SCHMITT, DIANE TURKIN

Book Reviews: KATHERINE LIVINGSTON, *Editor*; LINDA HEISERMAN, JANET KEGG

Letters: CHRISTINE KARLIK

Copy Editors: ISABELLA BOULDIN, OLIVER HEATWOLE

Production: NANCY HARTNAGEL, JOHN BAKER; YA LI SWIGART, ELEANOR WARNER; JEAN ROCKWOOD, LEAH RYAN, SHARON RYAN

Covers, Reprints, and Permissions: GRAYCE FINGER, *Editor*; CORRINE HARRIS, MARGARET LLOYD

Guide to Scientific Instruments: RICHARD SOMMER

Assistant to the Editors: RICHARD SEMIKLOSE

Membership Recruitment: GWENDOLYN HUDDLE

Member and Subscription Records: ANN RAGLAND

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Area code 202. General Editorial Office, 467-4350; Book Reviews, 467-4367; Guide to Scientific Instruments, 467-4480; News and Comment, 467-4430; Reprints and Permissions, 467-4483; Research News, 467-4321; Cable: *Advances*, Washington. For "Instructions for Contributors," write the editorial office or see page xv, *Science*, 30 September 1977.

BUSINESS CORRESPONDENCE: Area Code 202. Business Office, 467-4411; Circulation, 467-4417.

Advertising Representatives

Director: EARL J. SCHERAGO

Production Manager: MARGARET STERLING

Advertising Sales Manager: RICHARD L. CHARLES

Marketing Manager: HERBERT L. BURKLUND

Sales: NEW YORK, N.Y. 10036: Steve Hamburger, 1515 Broadway (212-730-1050); 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, 111 N. La Cienega Blvd. (213-657-2772); DORSET, VT. 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581)

ADVERTISING CORRESPONDENCE: Tenth floor, 1515 Broadway, New York, N.Y. 10036. Phone: 212-730-1050.

Energy and Development

The United Nations Conference on Science and Technology for Development to be held in Vienna in September 1979 could be an important constructive event. Many observers, however, fear that it will be just another confrontation of politicians from developed and less developed countries. Transfer of science and technology cannot be accomplished by the interaction of politicians or by gifts of black boxes or tons of blueprints—a prerequisite is human interaction at an expert level.

The organizers of the U.N. conference might well draw lessons from a symposium entitled "Energy and Development in the Americas," held from 13 to 17 March near Santos, Brazil.* Participants came from 16 countries and included about 110 scientists, engineers, and government representatives. They brought to the meeting different backgrounds of knowledge and experience, and found mutual pleasure and benefit in friendly interchanges. Topics covered included nuclear energy, oil, oil shale, coal, synthetic fuels, hydropower, windmills, hydrogen, solar energy, biomass, efficient use of energy, and energy for rural peoples. The participants shared the belief that the days of cheap oil are over and the conviction that each country must survey its own energy resources and move toward an energy independence based on indigenous supplies.

For Latin America in general, this means an emphasis on solar energy, biomass, and the development of large hydropower potentials. Venezuela has a great oil resource in its Orinoco tar sands; Brazil, oil shale; Colombia, substantial coal reserves; and Mexico, newly discovered oil; but the region as a whole is lacking in fossil fuels.

A problem much on the minds of participants was the continuing crowding into cities of the peoples of Latin America. There was a search for a means of slowing this trend by making rural life more attractive. Ways of creating cheap, small, practical energy sources were discussed. A problem of the cities is to provide electricity. Today, Argentina, Brazil, and Mexico are proceeding with nuclear power plants. Some of their neighbors are considering following this path.

From the standpoint of energy research programs, the United States is clearly the leader in terms of quantity and scope. This country is also becoming expert at building "demonstration plants." But with respect to converting research into production facilities that make a difference to the country's energy supply, the United States lags.

Brazilians are moving ahead with the production of alcohol for motor fuel and of charcoal from eucalyptus trees for steel mills. The use of palm oil to supplement diesel fuel is on the horizon, and the development of hydropower is continuing.

Two speakers from outside the Western Hemisphere provided additional perspectives. The French are proceeding with the operation of a nuclear reprocessing plant and with practical means of disposing of nuclear wastes. They have developed and are implementing long-range plans for their energy future. If one takes into account the skimpy resources of the Indian subcontinent, the United States is put to shame by the Indians. They are building a large number of biomass converters to produce methane from cow manure. The heating value of the methane is five times that of the cow dung. Sludge from the digesters makes excellent fertilizer.

This international meeting, sponsored jointly by the Brazilian Society for the Progress of Science and Interciencia, was organized in less than 6 months. In the year and a half remaining before the Vienna meeting, the United Nations still has time to create sessions and an atmosphere in which significant interchange can occur.—PHILIP H. ABELSON

*The Proceedings of the Interciencia—SBPC Symposium, "Energy and Development in the Americas," including 35 presentations, will be published in July 1978 by the Sociedade Brasileira para o Progresso da Ciencia, Caixa Postal 11008, 01000 São Paulo, S.P., Brazil. Reports and recommendations of the five workshops of the symposium will be published in the May-June issue of *Interciencia*, available at \$2.50 (postpaid) from Interciencia, Apartado 51842, Caracas 105, Venezuela.