

# 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 GROBSTEN	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, CONSTANCE HOLDEN, DEBORAH SHAPLEY, NICHOLAS WADE. *Editorial Assistant:* SCHERRINE 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 DOREMAN, 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. Burklund, 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.

## Science in the Public Forum: Keeping It Honest

The debate on most matters at the intersection of science and society is largely conducted in the public, not the scientific, forum. When scientists express opinions on scientific matters in the public forum they are not subject to the sanctions that regulate opinions expressed in the usual channels of scientific communication. Because these traditional sanctions do not operate, the extra-scientific debate often tends to be irresponsible scientifically: lower standards of proof are demanded in the public than in the professional debate, and half-truths are too often perpetrated on the public by scientists.

This tendency seems to me to be increasing. For example, in a recent article in a magazine devoted to science and public policy a physicist implied that nuclear weapons might detonate the atmosphere—when, in fact, this was shown to be a nonproblem some 25 years ago. Or consider the current debate on nuclear power. Two petitions, one pronuclear and the other antinuclear, were signed by scientists. Presumably, in signing the petitions, the scientists were implying that they possessed sufficient technical knowledge to make judgments on nuclear power. How many of the signers of either petition had studied nuclear power sufficiently to have a responsible scientific opinion on this complex issue?

A plea for greater responsibility on the part of scientists when they engage in scientific debate in the public forum poses serious practical, even epistemological questions. How can one know, when two scientists disagree on a scientific matter, whether it is because the issue is really beyond the proficiency of science or because one scientist has investigated the matter more thoroughly than the other? Some scientific issues can be unequivocally answered by science; others, perhaps most that are at the junction between science and policy, cannot—either because science has not progressed sufficiently (as in the debate on depletion of the ozone layer) or because the issues are unanswerable *in principle* (as may be the case with respect to long-term prediction of climatic changes). It seems to me that the scientist must be beyond reproach in doing his homework thoroughly whenever he makes scientific judgments, and he must delineate as sharply as possible where science ends and what I call trans-science begins. If this makes for fewer one-armed scientists and more scientists who say "I don't know," this is a hardship that Senator Muskie (who seeks more scientists willing to speak with certainty) simply must accept.

It is sometimes suggested that when scientists participate in nonscientific debates in which they claim special expertise, their obligation to speak responsibly is no greater or lesser than that of a lawyer or a politician. But science *is* special because, unlike law or politics, it deals with verifiable knowledge. Scientific methods of arriving at the best approximations to truth are known and tested. If scientists allow themselves the right to speak sloppily on science in the public forum, I think that this habit could gradually encroach upon the scientific forum.

Can we imagine mechanisms for injecting more responsibility into the scientific debate when it is conducted outside the scientific forum? Several suggestions have been made. For example, Arthur Kantrowitz has proposed a quasi-judicial scientific body that would conduct inquiries into conflicting scientific claims. The Operations Research Society of America, a few years ago, established a special panel to investigate contradictory technical assertions made by scientists in the debate on deployment of antiballistic missiles. Committees on ethics now exist within many professional societies. Should similar committees be set up by scientific societies?

The AAAS is a natural focus for these concerns. I would hope that the officers and members of the AAAS could exchange ideas on how to make the scientific debate in the public forum more responsible. Out of such an exchange might come better mechanisms for keeping our science honest, even when it is not subject to the usual sanctions of the scientific community.—ALVIN M. WEINBERG, *Director, Institute for Energy Analysis, Post Office Box 117, Oak Ridge, Tennessee 37830*