

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*; WILLIAM J. BROAD (intern), LUTHER J. CARTER, CONSTANCE HOLDEN, ELIOT MARSHALL, 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 Editor: ISABELLA BOULDIN

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: Advancesci, Washington. For "Instructions for Contributors," write the editorial office or see page xi, *Science*, 29 September 1978.

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.

Instrumentation Funding

New measures are urgently required to bring under control the accelerating decline in the quality, quantity, and development of scientific research instruments in the United States. The main cause of the deterioration of equipment is lack of adequate funds for maintaining and updating it. Two major factors contribute to this lack. There has been a marked rise in replacement costs over the past decade due to inflation and to greater sophistication of the equipment. Simultaneously, there has been a decrease in the funds available for equipment, due to the effective 19 percent decline in federal expenditures for basic research combined with pressures to use the available research budgets to maintain existing operations despite the increased cost of personnel and supplies. Thus attention should be given to funding policies that will permit increased efficiency and cost effectiveness in the utilization of existing advanced instrumentation.

In the present tight money climate, the decline in the quality of scientific equipment can be reversed only by increasing the opportunities for sharing of technological resources. A significant shift in the distribution of funds available for instrumentation and a restructuring of funding policies are needed to achieve this goal. Existing avenues for the funding of costly instrumentation include both categorical grants and shared resources. Categorical grants, which are designed to further specific projects, neither mandate the sharing of instrumentation acquired under their terms nor provide for the cost of sharing—that is, the costs resulting from increased use. Instrumentation facilities funded as shared resources do not suffer from lack of use when the operational funds include an adequate provision for the cost of sharing. A properly managed shared resource best ensures both utilization of the instrumentation and maximum access to it.

Existing funding patterns are at variance with the need for wider sharing of resources. The Division of Research Resources of the National Institutes of Health (NIH) has had a constant level of funding since 1967. Since the rate of inflation in equipment costs in many cases exceeded 100 percent over this period, the net decrease in instrumentation funding far exceeds the estimated 19 percent decline in the support of basic research. The Division of Chemical Instrumentation of the National Science Foundation (NSF) recently announced an instrumentation program to establish regional laboratories. Although this is a commendatory beginning, no ongoing funding for full implementation has yet been secured. No specific provision exists within the NSF to fund major instrumentation for biological research.

We strongly endorse the NSF chemical instrumentation program and recommend that a parallel program be established for biological instrumentation. We further recommend that the NIH Division of Research Resources be revitalized, at least to its earlier levels of activity. A three- to fivefold increase in these budgets will be needed to prevent a continuing decline in the utilization of advanced technology and technological innovation in the United States. We would prefer to see a net increase in the appropriations earmarked to meet instrumentation needs. Barring such a possibility, it may be essential to change the distribution of the national R & D appropriation.

It is therefore recommended that the renewal and development of scientific equipment be specifically and primarily (although not exclusively) mandated to the divisions of federal granting agencies responsible for the establishment and maintenance of shared resources. At present these are the NIH Division of Research Resources and the NSF Division of Chemical Instrumentation; an NSF Division of Biological Instrumentation should be added. A substantial increase in their budgets should be mandated by Congress.—E. R. BLOUT, *Harvard Medical School, Boston, Massachusetts 02115*; D. M. GRANT, *University of Utah, Salt Lake City 84112*; O. JARDETSKY, *Stanford University, Stanford, California 94305*; W. D. PHILLIPS, *Washington University, St. Louis, Missouri 63130*; K. R. PORTER, *University of Colorado, Boulder 80302* (*Ad Hoc Committee on Instrumentation Funding*)