For Your Information

Scientists Weigh In against Data Disclosure Law

A provision that would require scientists to provide research data in response to requests made under the Freedom of Information Act (FOIA) has caused an outcry in the scientific community. A number of groups, including the AMS Committee on Science Policy, have issued public statements calling for repeal of the provision.

Inserted at the last minute as an amendment to the omnibus spending bill passed by Congress last October, the provision is the work of Senator Richard Shelby, Republican of Alabama. The Shelby amendment mandates revision of a set of rules of the Office of Management and Budget (OMB), called Circular A-110, which pertain to disclosure of data by researchers supported by federal funding agencies. According to the amendment, OMB must now require these agencies "to ensure that all data produced under an award will be made available to the public through the procedures established under the Freedom of Information Act." Under FOIA, any person, including non-U.S. citizens, can request government agency records, subject to certain exemptions like national security and personal privacy. The Shelby amendment also states that the agencies may collect "reasonable user fees" equal to what it would cost to produce requested data.

Scientists have expressed deep concern over possible ramifications of this provision. One of the biggest problems is that the term "data" is not clearly defined. The law could apply to raw research data that has not yet been checked or analyzed, or to personal or medical data about human subjects in clinical trials. The law also does not exclude the possibility of an extreme interpretation of the word "data" to include computer programs, drafts of research papers, e-mail correspondence, and other documents involved in scientific research. The provision could also endanger foreign patent rights of researchers, since citizens of foreign countries where patent laws differ from those in the U.S. might be able to use FOIA to obtain information about inventions. A statement passed by the AMS Committee on Science Policy stated that the Shelby amendment "will lead to unintended and deleterious consequences to U.S. researchers and to research accomplishments."

As government regulation has increasingly come to be based on the results of scientific research, confidentiality of research data has become a thorny issue. A story in the February 5, 1999, issue of the *Chronicle of Higher Education* noted that business and industry have long lobbied Congress for access to research data, arguing that, because of the cost of complying with regulations that are based on federally funded research, they have a right to conduct independent reviews of the data on which the research is based. The *Chronicle* story also said that some researchers "fear that businesses will exploit the [Shelby amendment] to attack research that is not favorable to their industry."

Following the outcry over the Shelby amendment, the OMB issued in February 1999 a proposed revision to Circular A-110 that was intended to limit the scope of the Shelby amendment to apply only to "research findings used by the federal government in developing policy or rules." In response to the OMB's invitation for comment on the revision, many scientific organizations continued to express the same concerns as they had before. "We believe that the Shelby amendment and OMB's well-intentioned efforts to limit its scope are fatally flawed," wrote

Bruce Alberts, president of the National Academy of Sciences (NAS), in a letter to OMB. His letter noted that the revision added further detail but let stand the directive to make "all data" available under FOIA. "Our view is that new legislation will be needed, either to repeal the Shelby amendment or to provide a more reasonable approach for making selected data collected under particular research grants available to the public." A number of groups have suggested that the NAS could study the issue of data access and provide guidance to Congress.

The commentary period for the OMB revision ended on April 5, 1999, but it is expected that the debate will continue in the months to come. The organizations issuing public statements on the matter, apart from the AMS and the NAS, include the American Association for the Advancement of Science, the Joint Policy Board for Mathematics, and the National Science Foundation. Further information, including the complete statement of the AMS Committee on Science Policy, may be found on the AMS Web site at www.ams.org/csp/.

—*Allyn Jackson*

National Academy Report on Evaluating Research

The effectiveness of federally funded research programs, both basic and applied, can be assessed meaningfully on an annual basis as required by law, says a new report from the Committee on Science, Engineering, and Public Policy, a joint committee of the National Academies of Sciences and Engineering and the Institute of Medicine. However, different criteria should be used for different types of research to ensure that assessments fairly gauge progress.

"Measuring the performance of basic research is particularly challenging because major breakthroughs can be unpredictable and difficult to assess in the short term," said committee chair Phillip A. Griffiths, director, Institute for Advanced Study in Princeton. "Federal agencies should use a method we call 'expert review' to assess the quality of research they support, the relevance of that research to their mission, and the leadership of the research. This will ensure that funds spent on the research will generate the kinds of knowledge that in the past have brought great practical benefits."

During the course of its study, the committee heard two conflicting viewpoints on approaches to measuring basic research. One held that it is possible to measure research annually and provide quantitative measures of the useful outcomes of both basic and applied research. The other viewpoint was that given the long-range nature of basic research, no sensible way exists to respond to the annual measurement requirement. Therefore, some agencies may resort to using measures that seem to respond to federal law—such as a list of the agency's top 100 discoveries of the preceding year—but are actually meaningless.

"We concluded that both basic and applied research can be evaluated meaningfully on a regular basis," said Griffiths. "But it is important that agencies evaluate their research programs using measurements that match the character of the research." Differences in character will lead to differences in the appropriate time scale for measurement, in what is measurable and what is not, and in the expertise needed by those who contribute to the measurement process, the report says.

All federal agencies are mandated by law, under the Government Performance and Results Act (GPRA), to set goals and use performance measures to encourage greater efficiency, effectiveness, and accountability. GPRA requires that agencies write strategic plans with annual performance targets and produce an annual report that demonstrates whether these targets are met. The first performance reports are due in March 2000.

The most effective means of evaluating federally funded research programs, the committee said, is expert review, which should be used to assess both basic and applied research. The committee outlined three forms of expert review and their applications: quality review, relevance review, and benchmarking.

To assess quality, peer review should be used, the committee said. Relevance review draws on not only the views of experts in the field but also of potential users and experts in related fields to evaluate the relevance of the research to an agency's mission. Benchmarking reviews use panels of experts from the United States and elsewhere to judge the international leadership status of the United States in research.

Basic research involves theoretical or experimental investigation to advance scientific knowledge without immediate practical application as a direct objective. Because many years can pass before an advancement is achieved, the outcomes or results of basic research cannot be measured on an annual basis but only in retrospect, the committee concluded. However, agencies can regularly assess the progress of basic research in terms of quality and relevance to agency goals and intended users. Another proposed measure is leadership—that is, whether the research is being performed at the forefront of scientific and technological knowledge and leads the world in that particular field.

Applied research uses knowledge gained through theoretical or experimental investigation to make things or create situations that will serve a practical purpose. Programs in applied research usually include a series of milestones to be reached by particular times and a description of the intended outcomes as well as their significance to society. Progress toward these milestones can be measured annually, the committee found.

To produce and benefit from advances in science and technology, the nation also must have a continuing supply of well-educated and highly trained scientists and engineers, the committee said. Strategic and performance plans should focus more attention on the goal of developing and maintaining human talent in fields critical to the agencies' missions. To ensure this, agencies should require and evaluate education and training components in research programs.

In conducting its study, the committee reviewed and assessed the strategic and performance plans of ten federal agencies: the U.S. Departments of Agriculture, Defense, Energy, and Transportation, as well as the National Institutes of Health (NIH), the National Science Foundation (NSF), NASA, the Environmental Protection Agency, the National Institute of Standards and Technology, and the National Oceanic and Atmospheric Administration. The study was sponsored by the National Research Council, NSF, NIH, NASA, and the U.S. Departments of Agriculture, Transportation, and Defense.

Copies of *Evaluating Federal Research Programs: Research and the Government Performance and Results Act* are available from the National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20418; telephone: 202-334-3313 or 1-800-624-6242. The cost of the report is $18.00 (prepaid) plus shipping charges of $4.00 for the first copy and $.50 for each additional copy. More information about the report and the committee's work is available at http://www2.nas.edu/cosepup/.

—from NAS news release

New NSF FastLane Implementation

In July 1998 the Directorate for Mathematical and Physical Sciences (MPS) of the National Science Foundation (NSF) announced the implementation of its FastLane system in phases beginning in fiscal year 1999 and reaching completion by the end of fiscal year 2000. According to the schedule, the FastLane system will be implemented in all MPS programs starting July 1, 1999. Under this system, full electronic submission is required for all MPS proposals, with the exception of those sent in response to Foundation-wide solicitations. Further information and complete instructions for using FastLane functions can be found at the World Wide Web site http://www.fastlane.nsf.gov/.

The mathematical sciences contact within MPS is Keith Crank, telephone: 703-306-1885, e-mail: Dmsfl@nsf.gov. The FastLane coordinator is Florence Rabanal, telephone: 703-306-1998, e-mail: frabanal@nsf.gov.

—From an NSF announcement

Sloan Dissertation Fellowships Program to End

The Dissertation Fellowship program sponsored by the Alfred P. Sloan Foundation will close at the end of 1999. Each year the program awarded fellowships to 50 graduate students: 25 in mathematics and 25 in economics. The fellowships provided full tuition and a stipend for one year. Fellowship recipients were chosen in a national competition in which leading doctoral departments were invited to nominate candidates.

Michael S. Teitelbaum, program director at the Sloan Foundation, explained that the Dissertation Fellowships were started in 1984 in response to declines in federal support for graduate students. Although the program was always intended to be limited in time, he said, it has endured far longer than any other Sloan Foundation program except the Sloan Research Fellowships, which were started in 1955.

The Dissertation Fellowship program has run smoothly and efficiently and has supported high-quality students, Teitelbaum said. However, "we believe that sixteen years—unusually long for us, and longer than was intended at the program's initiation in 1984—is a reasonable period to have sustained this program."

Information about Sloan Foundation programs may be found on the Web site www.sloan.org/, or by writing to: Alfred P. Sloan Foundation, Suite 2550, 630 Fifth Avenue, New York, NY 10111-0242.

—Allyn Jackson

1999 Arnold Ross Lectures

Each year the AMS sponsors the Arnold Ross Lectures, a special one-day program of talks by prominent research mathematicians presented to an audience of talented high school mathematics students and their teachers.

The 1999 Arnold Ross Lectures were held on April 13 at the Museum of Science in Boston. The lecturers were I. M. Singer of the Massachusetts Institute of Technology and Ingrid Daubechies of Princeton University. About seventy-six students and teachers from the greater Boston area, as well as groups from two New Hampshire high schools, attended.

Singer, a recipient of the AMS Bôcher Prize, the Wigner Medal, and the National Medal of Science, is an institute professor at MIT. His lecture was entitled "The Gauss-Bonnet Theorem".

Daubechies, the first woman to hold a tenured professorship in mathematics at Princeton, received a MacArthur Fellowship in 1992 and the AMS Satter Prize in 1997. The title of her lecture was "What do engineers, mathematicians, and physicists have in common? Wavelets!"

In her opening remarks Deborah Tepper Haimo, of the University of California, San Diego, and chair of the Arnold Ross Lectures Committee, provided some history of the Arnold Ross Lectures. The High School Lecture Series was begun in 1988 by Paul J. Sally Jr. of the University of Chicago. The lectures that year, as in 1999, were held at the Boston Museum of Science. Other locations over the years have been San Diego (1990); Chicago (1992); Columbus, Ohio (1993); Minneapolis (1994); Houston (1995); and College Park, Maryland (1996). The lectures were renamed in 1993 and dedicated to Arnold Ross, a professor at Ohio State University, in honor of his many significant contributions to the development of mathematical talent among high school students.

—Sandra Frost

Mathematicians in Mathematics Education Project

The Math Forum is now collecting information on how mathematicians can be effectively involved in school education. The purpose is to document and encourage productive involvement of mathematicians in education from kindergarten through grade 12. The emphasis is on low (or no) budget involvement in the schools: special math days, working with students, working with teachers, lending expertise to schools and school systems, getting on and working on school boards, and so forth.

More information about the project, as well as descriptions already submitted, can be found at the Mathematicians in Mathematics Education Web site, http://forum.swarthmore.edu/mathed/mime/. Descriptions of what you have done can be submitted to Web site organizers Judy Roitman, roitman@oberon.math.ukans.edu and Susan Addington, susan@math.csusb.edu.

—Math Forum announcement

Call for Descriptions of Mathematics Ph.D. Programs

The Center for Instructional Development and Research and the Graduate School at the University of Washington have received a $515,000 grant from the Pew Charitable Trusts to develop an extensive nationwide inventory of initiatives to reform doctoral education. The Re-envisioning the Ph.D. Project intends to include any projects in mathematics that call for modification in the requirements to obtain a Ph.D. and also programs designed to change the way doctoral students are prepared to become college and university professors. Researchers are currently reviewing the literature on the subject of doctoral education and interviewing representatives of industries, businesses, and government agencies that hire doctoral graduates, as well as individuals in key educational institutions and organizations.

To ensure that the discipline is represented in the data and in the discussions, mathematicians are encouraged to contact the researchers at re-envision@cidr.washington.edu with responses to the following questions: (1) Have the requirements of the Ph.D. changed in your department or are changes anticipated? (2) Have you or your colleagues produced materials, praise, or criticism related to the Ph.D.? (3) Are there examples of current and promising practices or programs that mathematics departments have implemented? (4) Are there key individuals who should represent mathematics on the project advisory committee?

American graduate education has come under attack in recent years from critics demanding a profound rethinking of its traditional emphases and practices. One major complaint is that the traditional doctorate is too exclusively concerned with scholarly research. This narrow focus leaves students inadequately prepared for the other responsibilities of faculty life and unprepared for the growing percentage of job opportunities for doctoral graduates in business, industry, and government.

An advisory committee of eight to ten people representing the many segments of society who care about the Ph.D. has been formed for the purpose of reviewing the progress of the research and contributing to it. This group will also commission papers describing promising ideas and avenues to pursue based on the information thus far collected and analyzed. The culmination of the project will be a conference to be held at the University of Washington in the spring of 2000.

Further information is available online at http://depts.washington.edu/envision/ or by calling 206-543-6588.

—From a news release of the Re-envisioning the Ph.D. Project

DMS Recommends Funding for Three Institutes

The competition for mathematics institutes funding from the National Science Foundation (NSF) has ended in a recommendation that the NSF fund three institutes. On May 6, 1999, the NSF's Divison of Mathematical Sciences (DMS) made the recommendation to the NSF Director and to the National Science Board, the governing body of the Foundation. The extensive competition and review process began in late 1996.

The DMS has recommended renewal of awards to the two institutes it currently funds: the Mathematical Sciences Research Institute (MSRI) in Berkeley and the Institute for Mathematics and its Applications (IMA) at the University of Minnesota. It has also recommended the establishment of a new institute, the Institute for Pure and Applied Mathematics (IPAM) at the University California, Los Angeles. MSRI focuses on core mathematics, IMA on applied and industrial mathematics, and IPAM on interdisciplinary research involving mathematics.

The final decision about the funding of the three institutes had not been made at the time of this writing. The *Notices* will publish further information when it becomes available.

—Allyn Jackson

Correction

The April 1999 issue of the *Notices* carried an announcement about the appointment of Philippe Tondeur as director of the Division of Mathematical Sciences at the National Science Foundation. The announcement contained an error concerning his appointment at the University of Illinois at Urbana-Champaign. Tondeur joined the faculty of that university in 1968 and became a full professor there in 1970. The announcement also underestimated his number of publications. At this writing MathSciNet lists 90 publications by him.