

creativity for our working scientists of the next generation."

Another speaker, Al Gore Jr, the Tennessee Democrat who heads the Senate's science research subcommittee, also noted that science confronts many social priorities in the Federal budget. Science funding was not at the top of the agenda of any member of Congress, he observed. "The way the country as a whole responds to the

appeal for scientific research includes their demands for education and economic competitiveness." Despite his words of warning, Gore, along with Senator Pete Domenici, a New Mexico Republican, and Representative George Brown Jr, a California Democrat and chairman of the House science committee, sent copies of Lederman's report to their colleagues.

—IRWIN GOODWIN

CONGRESS HEAPS FUNDS ON EPSCOR FOR RESEARCH IN 'HAVE-NOT' STATES

EPSCOR is the acronym for a little-known program within the National Science Foundation that has recently come in for well-deserved mimicry around Washington. The program, bearing the full name of Experimental Program to Stimulate Competitive Research, operates on a small budget, amounting to \$11 million in fiscal 1991, to "leverage" support for science and engineering in 16 states and Puerto Rico. It was created in 1979 in response to Congressional criticism that NSF was not fulfilling a requirement of its original act to strengthen scientific research throughout the country and to avoid undue concentration of such research. The purpose of EPSCOR is to improve research in states that have historically fared poorly in their efforts to attain Federal funding. Many in Congress argue that NSF peer reviews for awarding R&D grants are nothing more than an elitist "good old boy" system that rewards the "haves" and ignores the "have-nots." Senator Ted Stevens, the Alaska Republican who is vice chairman of the board of Congress's Office of Technology Assessment, complains that NSF "neglects the possibility of excellence from smaller universities and states."

Congress expects to see more of EPSCOR in fiscal 1991 and in the years following. The program was featured in seven conference reports or appropriations bills last year. House and Senate conferees for the energy and water development appropriations bill called on the Department of Energy to devote "not less than \$2 million . . . for EPSCOR planning grants and \$2 million for Graduate Traineeship EPSCOR funding." The Department of Defense, the Environmental Protection Agency and the Department of Agriculture are also directed to introduce EPSCOR programs. NASA decided to get a jump on Congress: Program solicitation for its own version of EPSCOR, known as Capability Enhancement grants, went out last

October, and awards will be made early this year.

While the traditional method Congress uses to spread the wealth is to ladle out funds from the "pork barrel," this does not assure that money reaches the states that need help the most. Scientists and educators disapprove of the practice because it bypasses the peer-review process. In a 1989 study of academic pork, James Savage, of the president's office of the University of California system, found that between fiscal 1980 and 1989, "NSF's top ten research states received more than a third of all earmarks. Rather than creating geographical equity, earmarking helps the rich states get richer."

Formula for self improvement

EPSCOR, by contrast, acts as an affirmative action program to reward those states that almost always receive the smallest Federal research support. Proponents of the program claim the EPSCOR formula provides incentives for researchers in poorer states to pull themselves up by their own bootstraps.

So it is not surprising that EPSCOR has many friends in Congress. Among the program's influential champions are the chairmen of the appropriations committees in each house, Senator Robert Byrd of West Virginia and Representative Jamie Whitten of Mississippi. Both are from EPSCOR states. While President Bush's budget request for 1991 left the EPSCOR program in NSF at the 1990 level of \$9.8 million, Congress, largely through the persistence of Senator Bob Kerrey, a Nebraska Democrat, boosted its allocation to \$11 million. With the additional funds, NSF will be able to bring two more states into the program. The most likely additions: Kerrey's own state of Nebraska and neighboring Kansas.

States do not apply to participate in EPSCOR; they are chosen by NSF. The procedure begins with a pool of states

that have ranked below a certain level of research grants for a number of years. The states in this pool are rated by their Federal and NSF research support in three ways: total grants for all research, totals per academic scientist or engineer, and totals per capita. The lowest-scoring states become eligible to compete against one another for EPSCOR grants. The current EPSCOR states are Alabama, Arkansas, Idaho, Kentucky, Louisiana, Maine, Mississippi, Montana, Nevada, North Dakota, Oklahoma, South Carolina, South Dakota, Vermont, West Virginia and Wyoming. NSF officials also included Puerto Rico in the program.

Once the foundation puts out its program solicitation, an *ad hoc* state-wide EPSCOR committee in each eligible state, in collaboration with participating public and private academic institutions, responds with a two-part proposal. In the first part, the state explains its long-term strategy for improving research support at universities and indicates how much money it is willing to put up to match NSF's contribution. By demanding matching funds, NSF has coaxed some \$110 million from states, institutions and private donors in the first eight years of the program.

EPSCOR states have developed a variety of initiatives for state support: Over the past decade Montana's MONTs program (Montanans On a New Trac for Science) has provided close to \$400 000 a year to fund almost 250 investigators. The Oklahoma Center for Science and Technology, an organization representing the state, universities and industry, annually funds \$17 million worth of research, equipment grants, endowed chairs and state centers of excellence. The Wyoming Science, Technology and Energy Authority, helps the state legislature develop a research agenda for the state. In Arkansas, North Dakota and South Dakota, EPSCOR led to the creation of new funding agencies to support research.

The second section of the EPSCOR proposal contains requests to fund individual research projects. This part of the proposal goes through the customary NSF merit review process and those projects that do not meet the review standards are eliminated. "Reviewers judge the proposal in relation to the most excellent research in the field," says Joseph Danek, EPSCOR's former program director, who now directs the NSF Office of Experimental Programs. The number of awards granted depends on the quality of the proposals and the availability of funds.

EPSCOR has helped fund research for 132 faculty members and five research associates in Kentucky, in fields ranging from low-energy nuclear science to genetic engineering to economic modeling. At the University of Alabama at Huntsville, Mau-Kuen Wu was partly funded by EPSCOR in his experiments in high-temperature superconductivity. Lothar Schaffer of the University of Arkansas has received awards for his electron diffraction device developed under EPSCOR. Victor Kwong of the University of Nevada at Las Vegas was invited to do collaborative research with the Harvard-Smithsonian Astrophysical Observatory in plasma physics. This "couldn't have happened without EPSCOR," he says.

Four rounds of EPSCOR awards have been given since the program's beginning. In the first round of competition in 1980, up to \$3 million was awarded over a five-year period to each of five states out of the seven initially eligible. NSF intended these awards to be a one-time experiment. But in fiscal 1985 Congress reauthorized and expanded the program to include nine more states and Puerto Rico. Eight more awards were granted in 1985, leaving four EPSCOR states whose proposals had not been funded. All four states—Idaho, Louisiana, Mississippi and South Dakota—received special assistance grants in 1987.

The foundation intends to build on EPSCOR past successes by granting follow-on awards to programs that have done well under EPSCOR so far. To prepare all current participants for the 1991 grants, the foundation provided \$1.2 million in 1990 to each of the original five winners whose grants had run out by then, to bring them up to speed with states that won more recent awards.

Is giving money to the disadvantaged science and engineering community to help them help themselves a productive use of research funds? Senator John Danforth, a Missouri Republican and senior minority member of the Senate science research subcommittee, believes it is. At a June 1990 hearing on pork-barrel tactics, Danforth testified that the Federal government has the responsibility to spend its research dollars "in the most productive way. We should be buying only the highest quality research . . . If we squander our limited research dollars on projects that have not been subject to merit review . . . we doom the entire system to mediocrity." Nevertheless, he said, less advantaged institutions should be helped "through established pro-

grams [like] EPSCOR" that are based on merit. Donald Langenberg, chancellor of the University of Maryland and former deputy director of NSF, says "the key is not the money, it's the attitudinal changes the money helps to bring about."

Although the program has been successful at increasing the number of faculty in EPSCOR states, its cumulative effect on a state's ability to compete for R&D funds is harder to assess. While it is not uncommon for EPSCOR states to report that the program has helped 70% to 80% of their researchers win Federal support, it

has had little effect on the national rankings of those states as a group in terms of Federal R&D funding.

The foundation currently has no procedure for determining the states capable of competing on equal terms with the top-ranked states. It has no policy, beyond the whim of Congress, to specify how and when to add states. Belatedly, NSF is trying to develop a system of evaluation. It plans to prepare a database to produce state and institutional profiles of funding obtained through EPSCOR for comparison with national norms.

—AUDREY T. LEATH

DEMOCRATS PICK GEORGE BROWN TO HEAD HOUSE SCIENCE COMMITTEE

By choosing George E. Brown Jr as chairman of the Committee on Science, Space and Technology for the 102nd Congress, Democrats in the House of Representatives sent a message of hope to the scientific community. Brown is one of the few members of Congress who seriously places science and technology above all else on his legislative agenda. It wasn't only Democrats who hailed Brown's ascendancy. Brown, says Representative Don Ritter, a Republican of Pennsylvania, "brings to the committee a new sense of purpose, priorities and performance."

Leaders of scientific and academic organizations also expect Brown to be a more effective and sympathetic proponent for their issues than the committee's previous chairman, Robert A. Roe, a New Jersey Democrat. Roe became chairman of the House Committee on Public Works and Transportation, a job he has coveted for years. Roe was openly criticized in

the committee for not moving more quickly last spring on the 1991 NASA authorization bill, which sets policy and direction for the space agency. Brown, something of a loner who subscribes to no orthodoxy and shuns bombast and bickering, did little to discourage the view in political and scientific circles that the committee had grown increasingly irrelevant.

On 5 December, Brown was elected as the sixth chairman in the committee's history by a vote of 166 to 33, overcoming a last-minute challenge by Marilyn Lloyd of Tennessee, another devoted committee member.

Brown received a BS in applied physics from UCLA in 1946, after Army service in World War II, and completed some graduate studies in nuclear engineering and in political science on a Ford Foundation grant in the early 1950s. Before entering Congress in 1962 he was employed by the City of Los Angeles in engineering and management positions, as well as working in management consulting.

"Chairing the science committee will be unquestionably the most exciting challenge of my career," Brown said in an interview the day after his selection. "It comes at a time when our nation's technological base faces increasing competition, when global environmental problems are approaching crisis proportions and when we are beginning to rethink the research and development priorities that guided us throughout the cold war." His priorities in this Congress, he said, include setting realistic objectives for the US space program, deciding how best to proceed with the Superconducting Super Collider, developing practical alternatives to fossil fuels and finding ways to improve pre-college science education.

—IRWIN GOODWIN ■



Brown: Seeking increased relevance.