

Science Education: Where's the Beef?

After a decade of reports and presidential handwringing about the dismal state of U.S. science and math education, the federal government still hasn't got its act together. The Carnegie Commission on Science, Technology, and Government doesn't say it quite that bluntly, but that is the clear message in a report the commission is scheduled to release this week.*

Although the federal government is a bit player in the nation's education system, providing just 6% of school funds, the report notes that it can—and should—have a major impact on educational innovation and reform. Nowhere is this more true than in science and math, yet federal agencies will spend a mere \$515 million this year on efforts to improve the teaching of those subjects in kindergarten through 12th grade. That's just 4% of the total amount the government puts into all precollege education, the report notes.

One remedy the commission proposes is to give the Department of Education more flexibility in the way it spends its \$7.8-billion precollege education budget, most of which is currently parceled out in block grants. The department now runs only one program aimed at improving science teaching, the report points out, and even that consists almost entirely of noncompetitive grants.

More controversial is a suggestion that every science agency in the federal government should eventually devote a fraction of its research and development funds to math and science education. Only the National Science Foundation now spends a substantial portion—around 10%—of its R&D funds on those activities. If all agencies were required to follow suit, the report points out, that would generate \$4.8 billion for math and science education. As a start, the report suggests that the National Institutes of Health—which currently spends just 0.2% of its budget on precollege science and math education—should draw up a long-range program to help attract schoolchildren to biological sciences.

Suggestions that federal agencies set aside part of their research budgets for non-research activities tend to be greeted as sacrilege by the scientific community. But in this case, the recommendation is coming from some of the community's leading lights. The Carnegie report was put together by a task force, chaired by Lewis Branscomb of Harvard's Kennedy School of Government, that included biologist Eu-

gene Cota-Robles, physicist Leon Lederman, molecular biologist Maxine Singer, and aeronautical engineer Sheila Widnall.

The task force argues that the problem of precollege science and math education is so pressing that more funds, greater coordination among federal agencies, and rapid dissemination of the results of reform efforts are urgently needed. Noting that President Bush and the nation's governors have called for the United States to be Number 1 in science and math by the year 2000, the report has this to say:

"The graduates of the class of 2000 have

already finished third grade. How can these graduates expect to be the best in the world in science if, when they reach middle school, they find that 86% of the math teachers and 69% of the science teachers fall short of standards for course-work preparation set by professional associations of science and math educators? When they reach high school, will they still find that 71% of their biology teachers, 69% of their chemistry teachers, and 88% of their math teachers have substandard preparation in their subjects, as is the case today?"

The commission's own answer? There's great promise for dramatic improvement, but, "on the other hand, few areas of social development have more often seen hopes crushed and cynicism prevail." ■ COLIN NORMAN

New Award Debuts at NIH

In the past few weeks, 310 researchers at 146 institutions who thought they were out of the running for research support from the National Institutes of Health have gotten a pleasant and unexpected surprise. They have received word that they are the first recipients of a Shannon grant, a new award designed to provide stopgap funding to researchers whose grant proposals just missed the cut in the normal peer-reviewed funding process.

The Shannon grants were dreamed up by new NIH director Bernadine P. Healy and are being paid for out of her \$20-million director's discretionary fund. They are small grants—a maximum of \$80,000 direct costs over 2 years—and they account for only about 5% of NIH's total new grant portfolio, but they have a large symbolic value. They were intended to relieve some of the angst felt by the scientific community, which had watched with alarm as success rates for new grant applications plummeted over the past few years. "The Shannon awards will hopefully provide a stabilization, so you won't suddenly go from a grant that brings in \$250,000 to nothing," explained Healy at a press conference shortly after the awards were announced.

No one actually applies for a Shannon grant. Each institute at NIH was asked to come up with a number of nominees for the award. The emphasis was on funding innovative projects that didn't have enough data to convince a peer-review study section of their feasibility, and on preventing young researchers from being turned away from science at a critical stage in their careers. After the individual institutes made their selections, they were forwarded to a committee of senior extramural scientists, chaired by

John Diggs, NIH deputy director for extramural research, that made the final selection.

Although researchers have been delighted by the Shannon awards, some university administrators have grumbled that they include lower overheads than traditional NIH grants. When Healy first proposed the awards, NIH announced that they would come with indirect costs no greater than 20% of the total direct costs, which is about half the average indirect cost rate claimed by universities (*Science*, 31 May, p.1242). The cap has since been raised to 25%, or a maximum of \$20,000 during the life of the grant. But even at that rate, "institutions are going to be subsidizing these things," says Howard Gobstein, vice president of the Association of American Universities. "It's got to reach a limit because institutions just can't subsidize like that," he says.

Diggs responds that the Shannon grants are intended only as a bridge—with universities provided a portion of the support—until a researcher is able to enter (or re-enter) the normal funding pool. He says universities are mistaken if they think the Shannon awards are an indication that NIH is trying to move away from full funding of indirect costs. Moreover, Diggs points out that despite their concerns, no institution turned down a Shannon award, although several did write letters accompanying their acceptances expressing concern about the indirect cost issue.

Congress seems well pleased with the Shannon awards. The House Appropriations Committee went so far as to require that Healy spend "not less than \$14,500,000" of her 1992 director's discretionary fund on the awards, leaving a mildly exasperated Healy to wonder just what the word discretionary means. ■ JOSEPH PALCA

*In the National Interest: The Federal Government in the Reform of K-12 Math and Science Education.