

## Call for increased mathematics funding

The National Academy of Sciences (NAS) is close to recommending that the federal government double its funding for mathematics research over the next three to five years, says the chairman of an NAS committee studying the "astonishing and alarming state of affairs" in the mathematical sciences in the United States.

Speaking last week at an American Mathematical Society meeting in Louisville, committee Chairman Edward E. David Jr., president of Exxon Research and Engineering, told his audience, "I think it's astonishing because while no field associated with science and technology has advanced further, there is no major field that has lost as large a fraction of its federal research support in the last decade and a half." David added, "And it's alarming because at present funding levels, the community is losing its ability to sustain itself ... and the quality of its research."

One fear is that interest and activity in computer science has overshadowed the mathematical sciences, taking away both money and potential students. Joseph B. Keller of Stanford University in Stanford, Calif., says, "There is a concern about who is going to be heading the departments of mathematics in this country in the near future when the current crop of people begins to retire."

Historically, the U.S. mathematics

community has tended to divide into conflicting camps with differing priorities. Applied mathematicians, for example, have felt that the National Science Foundation and university departments have favored pure mathematics. "Both groups realize that the societal payoff is from the application of mathematics," Keller says, "but there's a difference of opinion about where the support should go." The difficulty is the considerable time lag before the incorporation of new mathematics into real-world activities, he adds. "If you were to go to any mathematics department and look at the kind of work that people are doing, neither they nor you would realize that it has any direct applicability," says Keller.

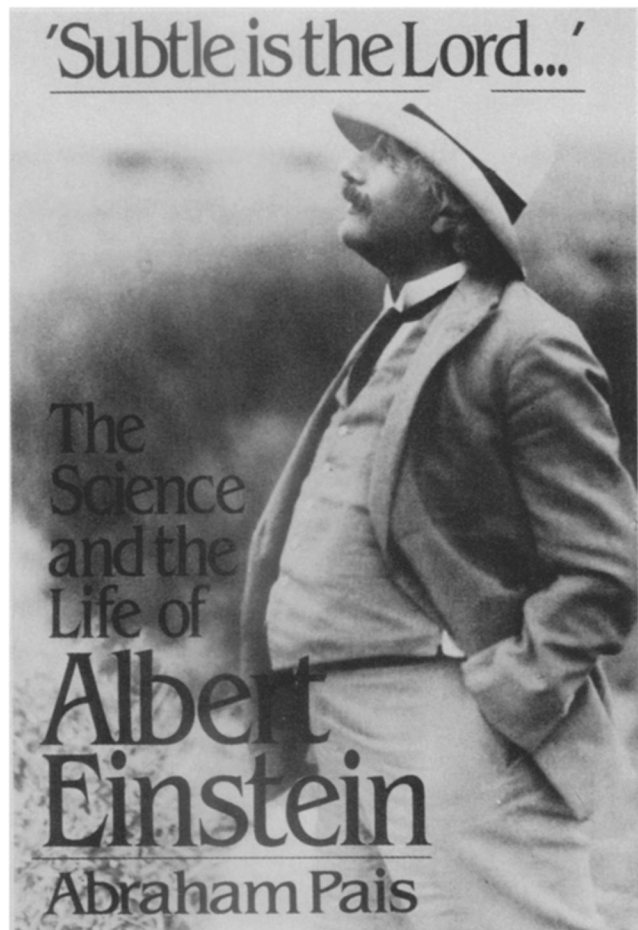
David warned that too few people outside mathematics understand the need for mathematics research because mathematicians have failed to communicate the nature of their work. One reason for the current predicament arises out of the longstanding perception among many people, including members of Congress, that "mathematics voyages along in such splendid isolation from other things that society can indeed afford not to pay that passage during times when budget stringencies strike," David said. Another common false impression is that "mathematics is already there," ready to be used when needed. "That new mathematics is being created and must be created escapes most of the outsiders," said David.

The cost of computing is also entering the picture. Unlike the other sciences,

mathematical research in the past has not needed funds for instruments or laboratories. However, I.M. Singer of the University of California at Berkeley says, "I think the day is coming when mathematicians will really use a computer as an experimental tool. That's going to be costly, but I think it's absolutely essential." The computer has already proven useful for checking examples and special cases.

Mathematicians at smaller institutions also often feel that the larger, more prominent schools are getting more than their fair share of funds. Singer says, "Good mathematicians are spread all over the place, so it isn't merely a matter of supporting the major centers. We need a much better communication network than we've had in the past."

The NAS committee report, which will be released in March after an official review, will likely recommend that federal support for mathematics research should increase from the present level of about \$78 million a year to \$175 million. The bulk of the funds would go into a new program that would provide grants for 1,000 graduate students, 400 postdoctoral researchers and 2,600 established mathematicians. With close to 10,000 mathematicians in the country, about equal to the number of physicists or chemists, this program would bring mathematics closer to the situation in physics and chemistry. At present, David said, "Mathematics is demonstrably and badly out of balance with the rest of the research enterprise in this country." —I. Peterson



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