NSF, Academy to Rank U.S. Mathematics

"Maintaining world leadership in science and technology" has become a mantra for U.S. policy-makers. The phrase, popularized by a 1993 report from the National Academy of Sciences (NAS), ranks as the top goal of the National Science Foundation (NSF), and it's a key pillar in the Clinton Administration's R&D policy. It also has bipartisan support. Last winter, for example, at a congressional hearing on federal science policy, the biggest disagreement between Democrats and Republicans was over how much to spend to ensure that the country stays ahead.

But that consensus glosses over a critical issue—measuring who's number one. This month, both NAS and NSF are putting the final touches to separate plans to compare U.S. efforts in a particular field with those of the rest of the world. If the experiment works out, the academy hopes to make similar comparisons for other fields. Although the NSF and NAS initially will examine the same discipline—mathematics—they will not be following the same path. Indeed, their approaches illustrate how a concept that may be easy to agree on is much harder to define.

"World leadership is not intuitively obvious," says Susan Cozzens, head of NSF's Office of Policy Studies and an expert on assessment. "The ideas from the 1993 report have been very much in the wind, so it behooves us to figure out what we mean by the phrase."

The 1993 report, written by the academy's Committee on Science, Engineering, and Public Policy, sees leadership as a nation's capacity to react quickly to a new scientific or technological breakthrough in another country, such as the 1985 discovery of high-temperature superconducting materials. "Can we participate if something important happens anywhere in the world?" is the way Ralph Gomory, president of the Sloan Foundation and co-chair of the committee, has described the concept in public presentations. By that measure, the key element is a healthy infrastructure—people, equipment, and facilities—that can be mobilized rapidly to focus on unexpected results.

That's what the academy is looking for in U.S. mathematics. The assessment will be done by an expert panel of a dozen or so scientists, who will rely primarily on their own judgments and will probably do the bulk of their work at one sitting. The review will cost an estimated $50,000, paid with internal funds, but officials hope that outside funding will allow them to repeat the experiment with two other disciplines before deciding whether it can be applied to all areas of science and engineering.

"Our goal is to measure whether we are world class, both in comparison with particular countries and with various regions, and to look at the trends," says Larry McCray, director of the academy's policy division. "We also hope to examine the factors that affect our relative strength—people, equipment, infrastructure, and the like. The focus is on the health of the field, not the size of its budget."

The NSF's survey will take a more detailed look at mathematics—no surprise, given that the agency is the major U.S. supporter of academic mathematics. "We want to know about the hot areas and where we stand with regard to the rest of the world," says Don Lewis, head of NSF's mathematics division. "The goal is to design the next 3 years of our portfolio."

Lewis hopes the "bench-marking" exercise, which could take a year and cost more than $100,000, will also tell NSF managers which funding mechanisms—summer salaries, workshops, interdisciplinary grants, and the like—are most likely to bring the desired results, and perhaps suggest alternative approaches used elsewhere. Program officers will be tapping the community for insights that they will share with the committee of experts. The committee is free to consult with its own experts, says Lewis, in a process that will extend for several meetings over the next 12 months.

The assessment is part of NSF's effort to comply with the Government Performance and Results Act (*Science*, 5 July, p. 27), which requires agencies to link their budgets to a set of broad goals and then measure their progress. "To know if we need to change strategies, we need to know if we have met our goals to date," says Cozzens. Part of the answer, she says, could lie in various quantitative measures—publication and citation rates, grants received, students trained, and the like—which NSF hopes to analyze and make available to the expert panel.

Assuming at least one project is a success, the next step will be to translate the findings into policy. And that's when real problems could arise, says one senior science administrator. "The hard part is seeking increased support for an important field in which you're already the clear leader, or saying that we can afford to cut back somewhere because it's not critical that we remain so far ahead," says the scientist, who requested anonymity. "After all, why go through the exercise unless you want something to change?"

–Jeffrey Mervis

BIOMEDICAL FUNDING

Cancer Charity's Rehabilitation Set Back

PARIS—France's Association for Cancer Research (ARC), once the country's largest single source of funds for research on cancer, is hoping to rehabilitate its image this fall, following a financial scandal that almost sank the organization. But last week, on the eve of a $1.6 million fund-raising campaign built around the slogan "Everything has changed at ARC, except cancer," it suffered another dose of bad publicity.

The most serious setback came on 10 October, when the French daily *Le Monde* published details from a leaked report on the charity's finances prepared by a special "financial brigade" of the judicial police. The report concluded that between 1990 and 1995, the organization had funneled more than $190 million to a network of suppliers that had been awarded exclusive contracts by ARC's former president, Jacques Crozemarie. The brigade reportedly concluded that a substantial fraction of these payments were the result of overbilling, false billing, and the award of dubious honoraria to Crozemarie and others allegedly involved in the affair. Crozemarie—who was forced to resign earlier this year—and nine others have been charged with breach of trust, falsifying documents, and related crimes in the ongoing scandal (*Science*, 5 July, p. 39).

A second blow fell the same day, when several television stations refused to run a 90-second spot ARC had prepared as part of its fund-raising campaign. The stations objected to two phrases in the film on the grounds that they were defamatory to Crozemarie and his co-defendants, who have not yet been judged in court. But a 12 October emergency meeting of ARC's administrative council, called by the charity's new president, Michel Lucas, agreed to cut the two phrases, and broadcast of the spots was expected to begin shortly.

At a press conference after the meeting, Lucas—a former government inspector who first sounded the alert about ARC's finances—declared that "we are as determined as we have ever been" to restore the organization's credibility and renew its fund-raising abilities, which have been crippled since the scandal hit the headlines earlier this year (*Science*, 9 February, p. 750). But the charity, which once pumped up to $60 million a year into biomedical research, has a long way to go: ARC's total contribution to research since January 1996 has amounted to only $15 million.

–Michael Balter