OTA Challenges Dogma on Research Funding

A new report bucks the conventional wisdom about how the federal government is supporting research

THE CONGRESSIONAL OFFICE OF TECHNOLOGY Assessment (OTA) is about to commit an act of heresy. A new OTA study* goes against the current dogma by daring to suggest that scientists may be better off now than they were a decade ago, that they may have adequate research facilities, and that they may not be the best group to set priorities for scientific projects.

These controversial conclusions—and more—are the result of a 2-year OTA examination, requested by the House Science, Space and Technology Committee, of how the federal government funds research and what Congress can do to maintain the health of the research enterprise. Last week, OTA presented a summary chapter of the report to the subcommittee on science chaired by Representative Frederick Boucher (D–VA). The full report will not be completed until next month.

OTA organizes its analysis along four lines:

■ **Understanding Research Expenditures**. Despite cries of distress from scientists about the difficulty of securing research funds, OTA points out that over the past decade federal funding for research has grown faster than inflation and more researchers are now being supported than ever before. Leon M. Lederman, professor of physics at the University of Chicago and president of the American Association for the Advancement of Science, articulated for the committee an explanation for why more money hasn't translated into happier scientists: Cutting edge research into subjects such as superconductivity and particle physics requires far more expensive equipment than it did 2 decades ago.

But OTA says the opposite can also be argued: "Analysis using crude measures of scientific 'productivity' suggests the cost of producing a published paper or performing a given scientific measurement has *decreased*: with less than double the investment per year since 1965, more than double the number of papers are published today in academia, and more than double the number of Ph.D. scientists are employed in the academic sector." One conclusion OTA draws from this is that the cost of research is only relevant when it is research the nation wants done.

OTA also challenges the oft-repeated dictum that research facilities are crumbling and that investment has not kept pace with need. The report points to a National Science Foundation (NSF) survey of research administrators at the top 50 universities who rated their facilities as "good" to "excellent."

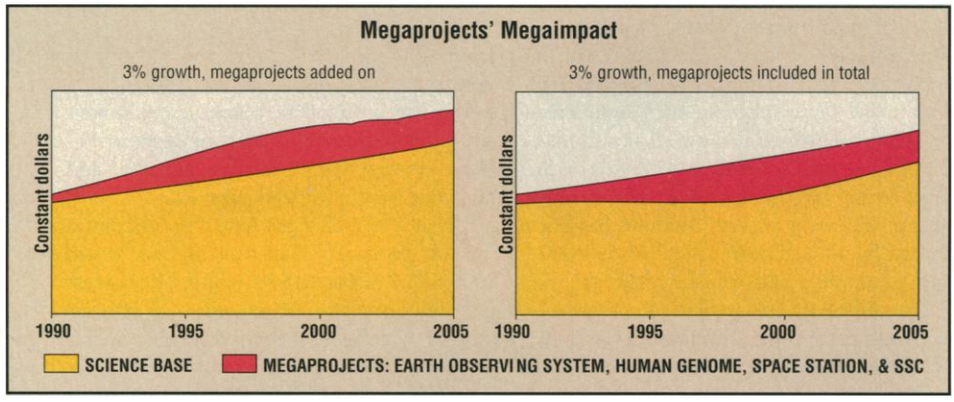
■ **Setting priorities**. "Can Congress look to the scientific community for guidance on setting priorities [for scientific projects]?" asks the OTA report. "The short answer is 'no.'" The reason: Although scientists have established processes—primarily peer review—for setting priorities within a scientific discipline, they have no suitable mechanism for evaluating projects across disciplines. Moreover, scientists are not necessarily the best placed to judge issues such as timeliness and the social and economic benefits of competing projects, the report suggests. Though it offers no detailed formula for setting priorities, the report says Congress should hold biennial hearings on the state of the research system in order to judge when the federal research portfolio is out of balance.

The report does, however, have one warning that will ring true with researchers. If scientific megaprojects, are not budgeted separately from the rest of federal R&D, core research programs are likely to suffer (see charts).

■ **Human resources.** OTA rejects as unreliable forecasts predicting serious shortfalls in the number of Ph.D. scientists in the coming decade. But the report says it is important to broaden the base of people entering science—specifically encouraging women and minorities to enter scientific careers—as a way to dampen the effect of temporary shortages in the science labor force. It offers one radical suggestion: The federal government could require that some fraction of all government research grants be spent on education.

■ **Data collection**. With the exception of NSF and the National Institutes of Health, few federal science agencies collect much data about how they spend their money. To provide a clearer picture of how the research enterprise is faring, says OTA, all agencies should collect better data on who is being funded, as well as on which projects get support.

Although OTA espoused many heretical viewpoints in its report, project director Daryl E. Chubin held firm to one well-established credo: pork-barrel funding of research projects is usually a bad idea. Robert S. Walker (R–PA), the ranking Republican on the full committee, said that many in Congress feel that earmarking is needed to break the stranglehold that some states have over the bulk of research funding. (The OTA report itself points out that "five states received 53% of the R&D funds in fiscal year 1990.") But Chubin told Walker that judging from past experience, earmarking "doesn't do very well" in addressing the problem of equitable distribution of funds. If equitable distribution is truly a Congressional goal, he added, then other, merit-based approaches should be employed. That, at least, should sit well with the high priests of science. ■ JOSEPH PALCA



The big squeeze. *Even if R&D funds grow by 3% a year, the science base will be flat for most of the 1990s if megaprojects are included in the total, as these models indicate.*

**Federally Funded Research: Decision for a Decade.* Office of Technology Assessment, U.S. Congress, Washington, D.C. 1991.