

## LETTERS

### NOAA's R&D Budget

President Reagan's budget for fiscal year 1985 proposes a reduction of about 32 percent [from \$244 million to \$165 million (1)] in research and development funding for the National Oceanic and Atmospheric Administration (NOAA). This Draconian cut occurs in the same budget that proposes a 28 percent increase in R&D funding for defense, a 14 percent increase for the National Science Foundation (NSF), and an 11 percent increase for R&D in the Environmental Protection Agency (1). Similar cuts have been proposed in President Reagan's budget each year since fiscal year 1981. Congressional leaders have resisted these efforts to disembowel NOAA, and the result has been a compromise, with actual funding reduced about 15 percent in constant dollars from fiscal years 1980 to 1984.

Some of the cuts proposed in the President's current budget will have direct and serious consequences for major national objectives if they are implemented. The following are examples.

1) Funds for acid precipitation research by NOAA are reduced from \$2.9 million to \$2.1 million (2), while the budget for the multiagency National Acid Precipitation Assessment Program increases from \$27 million to more than \$55 million (3). Authors of the Acid Precipitation Act, recognizing that NOAA's data resources and its comprehensive understanding of atmospheric processes are vital to the program, authorized \$5 million for coordination of research by NOAA. These funds have not been appropriated, and the scheduled cut would reduce NOAA's role from 11 percent to 4 percent of the national program.

2) Funding for NOAA research on understanding climate changes is reduced by about \$3.3 million. These cuts in research by the lead agency for the National Climate Program are scheduled just at the time that research is producing new knowledge and new insights at an unprecedented rate and climate has become a focus of scientific interest.

3) NOAA's solar-terrestrial research program (\$3.1 million) is scheduled for termination. NOAA and the Department of Defense jointly operate the Space Environmental Service Center to provide vital information on solar eruptions and their effects on communications and the near-earth space environment. Termination of NOAA research would have far-reaching effects on the operation of

the center that would adversely affect NASA, the Department of Defense, industry, and the public.

4) Research in ocean thermal energy conversion (\$0.5 million) and ocean mineral research (\$2 million) is to be terminated. The Sea Grant Program (\$36.5 million), which links university expertise and local marine development and protection activities, is slated for termination. These steps would almost eliminate NOAA's R&D on nonliving resources.

5) Research on living marine resources is reduced by 56 percent (from \$72 million to \$32 million); at the same time funding for this research by NSF and the Fish and Wildlife Service is increased by 10 percent (\$50 million to \$55 million) (4).

The implications of these cuts for national policies concerning acid precipitation, climate changes, operations in space, and development and protection of marine resources have received little attention. The scientific community has had no opportunity to review these or other budget reductions or to comment on their consequences. Summaries, such as the recent review of shifts in science priorities by G. A. Keyworth, II (Articles, 6 Apr., p. 9) have overlooked these issues.

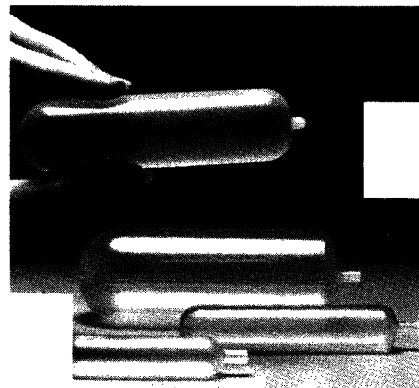
The NOAA budget presented to Congress is part of the Department of Commerce budget and is subject to the judgments and priorities of department staff. The Commerce budget is monitored in the Office of Management and Budget by staff sensitive largely to nonscientific issues; when the budget reaches Congress, authorization and appropriation bills are drawn up by committees whose primary concerns lie in areas other than scientific research. When the budget reaches the floor of Congress, the NOAA roles in interagency R&D programs are likely to be obscure, and members of Congress may easily overlook R&D programs. For these reasons NOAA, as a large science-based agency within a business-oriented department, is in an anomalous and weak position.

Budget decisions would be much more likely to reflect broad national interests if NOAA were an independent agency, as proposed by President Reagan in June 1983 (in his proposal to create a Department of International Trade and Industry), and if legislation were adopted defining more clearly NOAA's mission and its crucial role with respect to other agencies having related missions.

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### References and Notes

1. *Research and Development Funding in the Proposed Fiscal Year 1985 Budget* (Congressional Budget Office, U.S. Congress, Washington, D.C., March 1984).
2. These and subsequent NOAA budget numbers are based on *FY 1985 NOAA Congressional Submission Budget Estimates* (Office of Oceanic and Atmospheric Research, NOAA, Rockville, Md., February 1984).
3. F. A. White, *Bull. Am. Meteorol. Soc.* **65**, 374 (1984).
4. *Comparison of FY 84–85 Funding in Atmospheric and Oceanic Research for NOAA, NSF, NASA and Selected Agencies* (Office of Oceanic and Atmospheric Research, NOAA, Rockville, Md., February 1984).

### Patents and Research Freedom

Jeffrey L. Fox, in his article "Patents encroaching on research freedom" (News and Comment, 8 June, p. 1080), discusses a recent decision by the U.S. Court of Appeals for the Federal Circuit, *Roche Products Inc. v. Bolar Pharmaceuticals Co., Inc.* The title and tone of the article seem to us to imply that the decision somehow threatens research.

The court's decision crystallizes old law; it does not create new law. The decision ruled as infringement the unfair use of the patentee's invention by those who merely copy for their own profit. Specifically, the decision ruled that, during the 17 years of exclusivity, the use of a patented pharmaceutical compound for the purpose of testing or investigating it for drug approval constitutes patent infringement.

In the article an attorney for Bolar is quoted as saying that this opinion could "negate the experimental use exception, unless it's for pure amusement." The court's decision does not inhibit truly experimental use. Indeed, the decision reinforces its legitimacy by convincingly citing precedents.

Bolar did not even contend that its commercial use of Roche's invention would fall within the traditional experimental use exception; rather, Bolar contended that the exception should be expanded. But the court felt that "unlicensed experiments conducted with a view to the adaption of the patented invention to the experimenter's business is a violation of the rights of the patentee. . . . We cannot construe the experimental use rule so broadly as to allow a violation of the patent laws in the guise of 'scientific inquiry,' when that inquiry has definite, cognizable, and not insubstantial commercial purposes."

Thus the court correctly recognized that true "scientific inquiry" is exempted from patent infringement by the traditional "experimental use" exception. Neither the court's holding nor its lan-

guage gives rise to any suggestion that true "scientific inquiry" would be restricted. But the court also recognizes that labeling commercial activities as "scientific inquiry" does not make them such. A generic drug house's use of the patented invention—not for the purpose of true scientific inquiry but for the purpose of generating data for its own business purposes—was clearly and properly held to violate the laws.

We hope these comments place the significant decision of the Court of Appeals for the Federal Circuit in the proper perspective. The enforcement of patent laws against copyists will serve as an incentive to research and to those who financially support it. Nothing in the law or in the court's recent decision will inhibit true "scientific inquiry."

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### Factoring Work

I would like to correct several statements in the article by Gina Kolata, "Factoring gets easier" (Research News, 2 Dec. 1983, p. 999).

A group of us has been occupied with factoring integers for decades. This activity has been carried out independently of the American Mathematical Society (AMS), which has never sponsored our work, and of the yearly meeting of computational mathematicians in Winnipeg. The AMS has recently published our book of tables of factorizations (the Cunningham Project), which we gave to them. The manuscript was in camera-ready form. The factoring work is still ongoing; it is not work that has been "closed off" because of this publication.

Since the first computers were introduced some 35 years ago, mathematicians—certainly number theorists—have exploited computer hardware to solve their problems, using ingenious ideas of various kinds to gain speed. This is nothing new.

It was D. H. Lehmer and his father D. N. Lehmer who were involved with building sieves at the University of California and elsewhere to work on number theory problems. My associate in 1971 was Michael Morrison, not "John" Morrison.

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