SWEDEN

Buffeted Community Braces for More Change

In the midst of a fierce debate over who controls Swedish science, a new review advocating increased support for basic research gets a mixed report card

STOCKHOLM—Swedish science is in a state of upheaval. The country's research is renowned for its quality and receives a larger slice of the national income than in any other European country—3.7% of gross domestic product, twice the European Union average. But recent funding changes have brought unrest among researchers to the boil. Sweden's faltering economy during the 1990s forced the government to cut back sharply on state funding of basic research and environmental science, after having created independent foundations focusing on applied research. The result: a marked shift in funding from basic to applied research, and steady growth in the foundations' influence over science policy. All this has prompted a heated debate over who controls research.

To untangle this mess, the government last year set up a committee, mostly made up of parliamentarians, to carry out a thorough appraisal of the whole structure of Swedish research funding and its role in furthering the competitiveness of industry. Its conclusions, announced on 6 November, came as a big surprise to many: It recommended a complete change of emphasis, back toward support for basic science. "State-financed research should be steered by the priorities set by the scientific community," says physicist Stig Hagström, committee chair and head of the National Agency for Higher Education. The committee said basic research is fundamental to a knowledge-based society, and that it has the best long-term potential to support economic development.

The shift in priorities would be accompanied by a radical overhaul of the structure of science agencies. The committee suggests that the existing basic research councils, which fund academic researchers, should be scrapped along with a large number of government agencies that fund mission-oriented research. Instead, both basic and applied science should be supported by four new research councils under the Ministry of Education, covering humanities and social sciences, medicine, natural sciences, and technology. The committee also suggests creating an agency to promote interdisciplinary science and cooperation among the new councils. The independent foundations would remain in place, but Hagström says they should be brought under stronger political control. "If the money cannot come to politicians, the politicians will come to the money," he says.

The government is now canvassing opinions on the report before deciding whether to implement its recommendations. Reaction so far has been mixed. Many researchers have welcomed the recommendations, viewing them as promising a return to the halcyon days of unfettered support for basic research. "The report demonstrates that the politicians are now taking a step back and leaving the decisions to the scientific community," says Gunnar Öquist, secretary-general of the Swedish Natural Science Research Council, the largest of the existing councils. But the status quo also has strong support. "The mission-oriented government agencies have played a very important role in shaping new fields of research that have later become strategic for Swedish industry, such as information technology and materials science. The report names no valid reasons to incorporate them into the research councils," says Ulf Sandström, head of the Research Policy Group at Linköping University.

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—Stig Hagström

The problems for Swedish science began in the early 1990s. The economy was in recession and, in 1991, the Social Democratic government was ousted by a coalition of center-right and liberal parties. For ideological reasons the new administration dissolved the "wage-earner" funds—pools of money derived from a tax on industrial profits that were intended to balance industrial relations by giving trade unions more economic power—and in 1994 it used the money to create a number of independent science foundations. The largest of these, the Foundation for Strategic Research (SSF), started life with $800 million in its coffers, a sum that has since grown with the stock market boom.

The SSF began distributing grants in 1995 in areas it defined as strategic for Swedish industry, such as bioscience, information technology, materials science, forest science, and energy research. The statutes of the foundations were written to minimize political control over their funding. With new money flowing from the foundations, the government cut the research councils' 1997 budgets by 14%. The foundations intend to spend $200 million a year over the next 10 years, while the research councils had $220 million at their disposal in 1998. This shift in funding power has given the foundations considerable influence over research priorities at the universities.

Basic researchers, particularly those who could not meet the industrial relevance criteria set by the foundations, have welcomed the Hagström committee's call for a return to basic research. But that support has not been unqualified. Jan S. Nilsson, president of the Royal Swedish Academy of Sciences, thinks the proposed funding structure should have been more adventurous: "The new councils do not have a natural connection with problems that arise in society, which are often interdisciplinary in nature," he says. Arne Jernelöv, secretary-general of the Swedish Council for Planning and Coordination of Research, agrees that the conventional research council structure has difficulty accommodating some modern fields such as environmental research. And, he says, the proposed structure may also make it more difficult to transfer new scientific developments to industry: "The mission-oriented agencies have created a natural platform for dialogue between the researchers and those needing the new knowledge."

Harsher criticisms of the proposed council structure have come from Linköping's Sandström. He argues that putting scientists in charge of research policy would favor those who are already in the system. " 'Old boys' get financed much easier," he says, "while other groups such as women, younger scientists, and researchers in emerging fields face much tougher hurdles

CREDIT: PEKKA NÄRVÄ

to winning funds."

Social scientists are also unhappy because the report suggests cutting back their funding to support research in technology. Anders Jeffner, secretary-general of the Swedish Council for Research in the Humanities and Social Sciences, says that he personally does not agree with the logic of pitting social sciences and technology against each other. "If you increase technological knowledge, there also has to be an increase in knowledge about how to handle technology," he says. Boel Flodgren, rector of Lund University, says such a choice is regrettable, but increasing efforts in natural sciences and technology will be vital for Sweden, with its reliance on heavy industry. "We have realized that we are lagging behind in using and generating new knowledge on our own. We can't live off giving out Nobel Prizes," she says.

As for the independent foundations, the Hagström committee's options were limited: The government cannot close them down because they are protected by statute. But the committee suggests that their political independence be sharply reduced. The report advocates replacing the current boards—which are made up of a mix of academics, industrialists, and politicians—with boards that consist entirely of parliamentarians. That idea has drawn mixed reviews from the scientific community. A number of researchers who spoke to Science were guardedly supportive, as long as projects are also peer reviewed. Balancing resources among different fields should be the responsibility of politicians, says zoologist Dan-E. Nilsson of Lund University, the driving force behind an informal council of professors dedicated to preserving Swedish basic science.

The Hagström report is now being sent to interested parties for several months of consultation. If the initial reactions are anything to go by, the newly installed Social Democratic minister of education, Thomas Östros, will have plenty of opinions to work with when he draws up his plans this coming spring. The government hopes to put any changes in the structure of research funding into effect by January 2001.

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SCIENCE FUNDING

Brazil's Budget Crunch Crushes Science

Two cuts in the 1998 science budget, followed last week by an announced cut in the 1999 budget, have brought many science projects to a halt

RIO DE JANEIRO—It's more than 90°F outside. But no one turns on the air conditioner in the stuffy room in the Brazilian Center for Physics Research (CBPF) here, where representatives of Brazil's science establishment are meeting to discuss how to save the nation's scientific institutions from collapse in the midst of Brazil's economic downturn. With a budget deficit expected to reach 900,000 reais ($750,000) in January, the research center can't afford to cool its offices or conference rooms. "Our fear is that we will have to pay our bills out of next year's budget allocation," says João dos Anjos, CBPF's assistant director.

The physics center is not alone. Cutbacks in electrical use are common in cash-starved Brazilian universities and research centers these days. To meet the demands of the International Monetary Fund and other foreign lenders, who last week approved a $41.5 billion loan package, the free-spending Brazilian government cut its 1998 budget this fall, and it has agreed to slash its 1999 budget by $7.3 billion. As a result, on 10 November, the government announced that next year (the fiscal year begins in January), the science ministry will receive $619.4 million—18.7% less than it had requested.

The spiral began in earnest on 8 September, when the treasury department cut $160 million from the science ministry's already tight 1998 budget of $747 million. A second decree, issued on 30 October, trimmed another 5%. These cuts have pushed many universities and laboratories to the brink of insolvency, and with next year's budget now set well below the original 1998 level, little relief is in sight. The Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), the country's principal science funding agency, has distributed no new money for research in 1998. The only research funds available have come from the science ministry and from now-depleted state agencies. Only wealthy São Paulo still funds research, and the federal science ministry's direct support is limited to $50 million for multiyear, multisite projects.

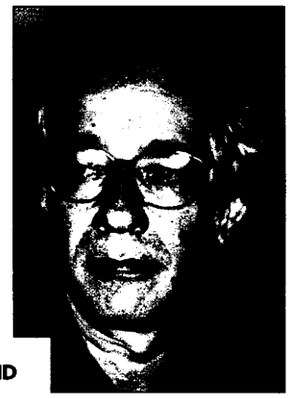
FEDERAL EXPENDITURES ON SCIENCE AND TECHNOLOGY IN BRAZIL (1990–1997)
(Thousands of 1995 U.S.$)

Year	Expenditure	Percent of 1995 Expenditure
1990	2277.9	93
1991	2145.5	87
1992	1635.2	67
1993	2288.8	93
1994	2466.8	100
1995	2457.0	100
1996	2350.9	96
1997	2311.0	94

CREDIT: SOURCE: CNPQ; PHOTO: VALQUÍRIA DAHER/REVISTA CIÊNCIA HOJE

Several ministers have rallied congressional support to minimize cuts in their 1999 budgets, but the science minister has not been among the lucky ones. "It's at times like this that science loses out, because we have no lobby," says Otávio Velho, anthropology professor at the National Museum of the Federal University of Rio de Janeiro.

Particularly hard hit is the CNPq. The science ministry slashed CNPq's 1998 budget from $479 million to $361 million—a 25% drop. It's been 2 months since the CNPq has paid bills for electricity, water, cleaning and security services, and rent for its headquarters in Brasília, capital of Brazil.



Losing out. Otávio Velho says science lacks political clout.

The agency oversees 10 scientific institutes, and no program has been spared the knife. The National Observatory expects to end the year with a debt of $210,000, including unpaid utility bills. Brazil's observation time on the La Silla telescope in Chile is scheduled for December, and astronomers are planning to pay travel and lodging out of their own pockets. Failure to show up could break Brazil's agreement with the European Southern Observatory, which administers the telescope, and cost Brazil the right to take part in the project. The observatory lacks the money even to pay for the gasoline needed to travel by car to a local telescope.

The situation is not much better in many