Not that the message is all bitter; there are plenty of comments and recommendations that the university community will find palatable (see box). PCAST, for example, accuses the federal laboratories of unfairly competing with universities for research dollars as they look around for a mission in the post-cold war world. It shames Congress for indulging in pork-barrel funding of science projects. And it criticizes the executive branch for using arcane accounting rules that fail to reimburse the full indirect costs of university research.

"Even the most prestigious university can no longer aspire to having departments in every human endeavor."

–D. Allan Bromley

Against that background, the panel urges universities and federal agencies to "refrain from developing or implementing research or education programs that would increase the net capacity of the system of research-intensive universities." For the universities, this means resisting the temptation to set up new research institutes and programs to attract new money without cutting existing projects. And for the government, it means not launching initiatives that would expand the academic research base without making compensatory cuts.

This is sure to prove controversial. According to James McCullough, a White House staff member who worked on the report, the panel had in mind politically popular initiatives like the Experimental Program to Stimulate Competitive Research (EPSCOR), which helps states that don't receive much federal research funding set up programs to attract more grants in the future. Congress added $5 million to the National Science Foundation's $20 million EPSCOR request this year, and the program is seen as a good way to address inequities in federal funding. But it also has a tendency to swell the overall pool of scientists expecting grants. Given the current budgetary forecast, PCAST argues, more EPSCOR-created research mouths to feed only increases the chance of an eventual famine.

This language "is not intended to freeze out the have-nots to protect the haves," Bromley says. "The important word is 'net'—some [universities] may move in or move out." As panel member Daniel Nathans, a Johns Hopkins Nobel Prize–winning biologist, puts it, "We certainly wouldn't want to discourage small universities from rising to the top."

Bromley is well aware that the universities may be uncomfortable with the overall theme of the report. "Change is always unpleasant," he says. "But even the most prestigious university can no longer aspire to having departments in every human endeavor." Bromley's cochair on the panel, Harold Shapiro, knows just how difficult it may be to convince universities of that; as the president of Princeton, Shapiro is in the midst of a lengthy restructuring exercise along the lines that the report recommends. Yet each decision must be worked out with the faculty—the group most threatened by cuts. Progress, needless to say, has been slow.

Shapiro, who says the intent is to recover some of the teaching values that excessive emphasis on research left behind, hopes the report will have a national impact, but he warns that "the solutions will be quite different at each university." Adds Robert Rosenzweig, the president of the Association of American Universities, "All the easy things have already been done—now you're asking people which of their children they want to sacrifice."

Bromley, who evidently sees the report as a major part of his legacy as science adviser, has asked President Bush to commend it to President-elect Bill Clinton as a nonpartisan clarion call that should not be allowed to gather dust with the rest of the outgoing Administration's policy papers. He is also pitching the report to the Clinton transition team as a worthy policy pursuit. And he is shopping it around Congress in the hopes that several committees will hold hearings on its recommendations in the new year.

"Perhaps for some people [the report] will paint too pessimistic a picture of future funding," says Nathans. But a more muted call would probably have been ignored. The reverberations of this report are likely to persist long after Bromley leaves the White House.

–Christopher Anderson

NATIONAL SCIENCE FOUNDATION

'Strategic Research' Wins the Day

After 6 months of turmoil at the National Science Foundation (NSF) over whether the agency should obey a congressional directive to shift funds into "strategic research" —science aimed at national industrial and economic needs—the results are finally in: Like it or not, it's happening. Although NSF's total research allocation this year is actually less than last year, it will spend nearly $100 million more in four strategic areas than it did in 1992.

These increases are detailed in NSF's 1993 operating plan, which was submitted to Congress on 21 December. The agency will spend $17 million more than in 1992 on manufacturing research and education, $38 million more on advanced materials and processing, $17 million more on biotechnology, and $25 million more on high-performance computing and communications. NSF will also channel a $5 million congressionally mandated increase in the Small Business Innovation Research program to the four areas.

These same strategic research areas are the subject of government-wide "crosscut" initiatives under the umbrella of the Federal Coordinating Council on Science, Engineering, and Technology. As such, NSF had marked them for big increases in its original budget request for this year. But in a year when NSF's overall $2.21 billion request for research and related activities was cut to $1.86 billion—$14 million below last year's figure—protecting these strategic areas means even bigger cuts in basic research. Since scientists sent in more than 800 letters last year, mostly urging NSF not to shift funds into strategic research, these cuts to core research programs suggest even bigger battles to come.

Two groups who are likely to scream the loudest are the physicists and the astronomers. Physics research will get $10 million less this year than the $138 million NSF spent last year. And astronomy will drop $9 million, to $103 million. Most of the rest of the pain is spread in small doses across the agency, leaving most programs outside the strategic areas at or slightly below their 1992 levels. Given that NSF is also planning to increase average grant size this year, "there are going to be a lot fewer grants, especially for new people," says Robert Park of the American Physical Society.

But as painful as this year's budget sacrifices will be, they could have been worse. When the Senate, in its appropriations report for NSF's 1993 budget, demanded more emphasis on strategic research, NSF went into full damage control mode. The National Science Board created a special Commission on the Future of the NSF to get the community's reaction; not surprisingly, it came back with a strong endorsement of the status quo—a continued focus on basic research. That may have tempered further shifts.

Congress is satisfied with NSF's response, at least for the moment. Both the Senate and the House appropriations committees have approved the operating plan. But the battle over NSF's role in strategic research is expected to resume in budget hearings later this year. "NSF can either keep trying to stave off the intrusions," says Darryl Chubin, an analyst with the congressional Office of Technology Assessment, "or it can take this opportunity to start taking the [strategic research] issue seriously."

–Christopher Anderson