budget resolutions would eliminate it next year. That threat has brought industry groups to the program's defense. At a workshop previously planned to discuss the effect of a $90 million cut in this year's budget, numerous company officials defended the program as the only way to support long-term, precommercial research in the face of skittish stockholders and venture capitalists.

"I think what they're doing here is as important as guarding the shores," said Robert Cross, president of Burr Ridge, Illinois–based Nanophase Technologies Corp., comparing ATP to national defense. Cross said his company's $1 million ATP grant was "critically important" in developing a new technology for making ultrafine inorganic powders used in ceramics manufacturing, and that the company recently signed a licensing agreement worth $20 million a year.

Administration officials encouraged the company executives to make known such success stories. "That message has got to get to the Hill," said Arati Prabhakar, director of the National Institute of Standards and Technology (NIST), ATP's parent organization. If Congress decides to fund only basic research, warned Mary Good, the undersecretary of Technology Administration at the Commerce Department, "we will end up in the next 10 years as the science base on which the world draws its precompetitive research." Added Commerce Secretary Ron Brown: "Calls for the elimination of the [Commerce] Department—or its essential technology programs—are just plain ludicrous. They amount to unilateral disarmament in the battle for global competitiveness."

But ATP and NIST officials acknowledged that the program is vulnerable. "In terms of our fate, I think we have a tough battle," said Prabhakar. "I'm not sure there is a great desire to truly understand these issues." Indeed, a staffer for one Republican scoffed at a comment from Gibbons that the Administration would consider new ways to restructure ATP if it is killed by Congress—including joint ventures with industry. "We already have restructured ATP," he said. "We eliminated it."

Gibbons is optimistic that some of the proposed cuts in R&D can be headed off as legislators learn more about the programs and understand their value to the country. "Philosophies change on the basis of what facts you have," he said. In addition, the budget resolutions are only spending guidelines and not binding on the appropriations committees. Even so, the newly energized science lobby may need to exercise political muscle as well as rational argument to win its case in the halls of Congress.

–Andrew Lawler

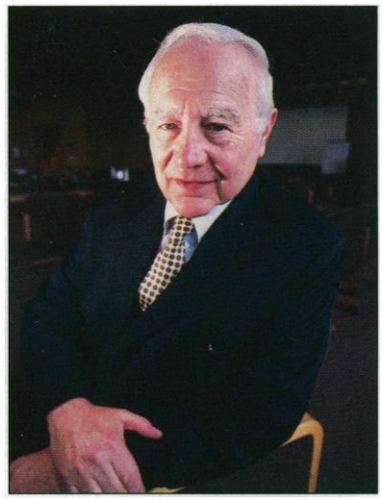
With reporting by Eliot Marshall and Robert Service.

WAR ON CANCER

Panel Offers Radical Therapy For National Cancer Institute

Leaders of the war on cancer received a blunt critique of their operations last week, along with advice on how to carry out a sweeping overhaul of the $2.1-billion-a-year National Cancer Institute (NCI).

The review—delivered by Michael Bishop and Paul Calabresi, co-chairs of a panel of independent researchers—called for major changes in NCI intramural funding, structure, and management. The panel began work last October at the request of Harold Varmus, director of the National Institutes of Health (NIH), and labored night and day to meet a deadline set for mid-May. Calabresi, a prominent clinician at Brown University, says members realized they would have to tackle sensitive issues, including NIH's desire to squeeze more science out of an institute with an aging staff and a frozen budget (*Science*, 10 March, p. 1412). Their final report attempts to do just that, calling for radical surgery. Varmus has indicated that if this therapy succeeds, it may be applied to other NIH institutes.



RICK KOZAK

Sensitive issue. Panel co-chair Paul Calabresi urges review of AIDS research.

The Bishop-Calabresi agenda asks NCI to trim and consolidate many intramural functions, scrutinize the growth of big labs (those costing over $1 million), "wean" NCI away from AIDS research, move researchers from a remote site in Maryland to headquarters, replace "muted" internal reviews with rigorous ones, hold senior scientists strictly accountable for the training of juniors, spur independent studies with special grants, and put working scientists on NCI's top executive council.

These and other ideas are sketched out in a 14-page summary given to the National Cancer Advisory Board (NCAB) on 16 May. The full text will be delivered in mid-June, 6 weeks before NCI is expected to get a new director. The agency has been without a permanent chief since March, when former Director Samuel Broder left. His successor, according to Varmus, will be in place by 1 August. Varmus couldn't say who that will be, although rumor has it that NIH cell biologist Richard Klausner is in line for the job.

The Bishop-Calabresi report has a provisional quality, but for many reasons, it's likely to make an impact. For one, it delivers the message in "plain language," Bishop said, even using terms that might "sound harsh" to some. But Bishop—a University of California, San Francisco, cancer biologist and winner of a 1989 Nobel prize with Varmus for oncogene research—added that the gritty sections were only meant to help "polish the gem" of NCI.

Reaction to the report at NCI has been muted, largely because researchers haven't yet had time to digest its implications. But the report has been welcomed by NIH's top brass. Deputy NIH director for intramural research Michael Gottesman notes, for example, that the conclusions "dovetail nicely" with recommendations for NIH-wide reform given by another panel last spring, following an inquiry by *Science* (27 August 1993, p. 1120). Varmus himself indicated that he intends to help the new NCI chief follow through on these proposals—the most prominent of which are summarized below:

■ *Reslicing the pie*. The panel found that the share of NCI funds devoted to intramural research—18% of the agency's budget by the official measure—was "disproportionately high." And Bishop said that "a more accurate figure" is actually 25%. That's the total one gets by including contracts that support intramural projects. This figure is at odds with the NIH norm: Overall, just 11.3% of the NIH budget goes to intramural science. The panel concluded that it would be "advisable" for NCI to "adjust the allocation" downward.

■ *Less AIDS, more cancer*. "We didn't go looking for this," said Calabresi in an interview with *Science*, but the panel stumbled onto what may become a treacherous issue for NCI in the future. About 35% of NCI's intramural projects are labeled AIDS research. But, as Varmus explained, they only fit this category by "some stretch of the imagination." Bishop noted that a "liberal definition" of AIDS permitted this trend to

develop, and he warned that NCI is now dependent on AIDS funding that may be precarious if the AIDS label is made more accurate. Furthermore, Bishop noted, this trend may have "distracted" NCI from its principal mission of cancer research. The Bishop-Calabresi panel urged NCI to conduct "an expeditious and comprehensive review" of all AIDS research, noting that "a significant reduction may be in order."

■ *Bad vibes*. The panel encountered "broad dissatisfaction" among NCI staffers with the agency's "hierarchical approach" to research management, a style that leads to the "intimidation of individual scientists and the authoritarian use of resources." The problem, said Bishop, was "alarmingly prevalent" and thoroughly documented in more than 100 confidential letters sent to the panel by NCI staffers. In this environment, Bishop said, independence is often suppressed, and "creativity can take a back seat" to obedience to lab chiefs. To improve the ethos, the panel asks NCI to make clear that lab and branch chiefs have a responsibility to educate junior staff, help recruit women and minorities, and encourage subordinates to develop independent careers. All supervisors should undergo "stewardship" reviews, the panel said, in addition to scientific reviews. A negative report would trigger a 1-year period of probation, followed by a second review. After a second adverse review, a person would cease to be a manager, although he or she could continue to do research.

■ *Attracting talent*. To recruit able young scientists to NCI and encourage creativity among those on board, the panel said NCI should adopt an academic tenure system (as NIH is now doing) and experiment with new funding mechanisms. The panel urged NCI to establish an NCI Distinguished Fellows program to fund as many as 10 young investigators per year, for up to 5 years each. And it proposed creating a $3 million fund to award 30 special grants each year to intramural scientists who come up with excellent proposals in an intramural competition. Winners could use the $100,000 grants to develop new ideas, without supervision.

■ *Improving peer review*. The panel found the system of intramural peer review lax and lacking in objectivity. "The term 'cronyism' was heard," Bishop said. He pointed out that the budgets of some labs have grown too large, with 55 exceeding the $1 million mark. The panel suggests that NCI set a trigger for special reviews of large labs. In place of the current system of site visits, which lacks "sufficient rigor," the panel recommended that laboratories undergo regular scrutiny by outside reviewers and that tenured and tenure-track investigators likewise be reviewed once every 4 years. All reviews should continue to be retrospective. The panel would like researchers to be judged not only on what they have produced, but on how well they have used money and other resources. The report emphasizes that all intramural projects should be subject to review, including those funded by contract.

■ *Restructuring*. Unlike any other institute, NCI mingles intramural and extramural research programs in four research divisions. The Bishop-Calabresi panel urges that this practice stop; it would divide the entire NCI portfolio into two segments—internal and external—each under a newly created deputy director. In addition, Calabresi noted a pattern in which NCI managers may have tried to placate the demands of prominent researchers by creating whole new branches or sections. This has created a "baroque" organization, Calabresi said. The panel suggests that all intramural research be grouped under two headings—focused on clinical and laboratory work—and that redundancies be eliminated. NCI's huge satellite research facility in Frederick, Maryland, with 2000 employees, should be reorganized and more closely linked to headquarters operations, the report said. The new drug discovery program at Frederick should be continued, the report says, but should be used and supported by all NIH institutes.

The report's harsh language is meant to "polish the gem" of NCI.
—Michael Bishop

■ *Clinical research*. The NCI intramural program is directly involved in patient care at several loosely coordinated sites—the Clinical Center near NCI headquarters, the Frederick center, and the Naval Medical Center hospital across the highway from headquarters. During its deliberations, Calabresi says, the panel considered asking NCI to drop these direct commitments and "contract out" for clinical research. In the end, the members felt this might lead to a catastrophic loss of public interest in NCI. Instead, the panel asks NCI to put all clinical research under one division.

How soon will NCI be able to act on this long agenda? Edward Sondik, acting NCI director, says NCI staffers could begin to prepare for some changes immediately. But "there's a lot of contextual material to digest," Sondik said. "We need to look at the 'why' that underlies these recommendations," to be discussed in the still-unwritten body of the report. Sondik added that "the new director will have a lot to say" about these decisions, some of which may have to be considered in "10-year increments." One thing is certain, though: the cancer warriors have plenty to think about as they wait for their new commander.

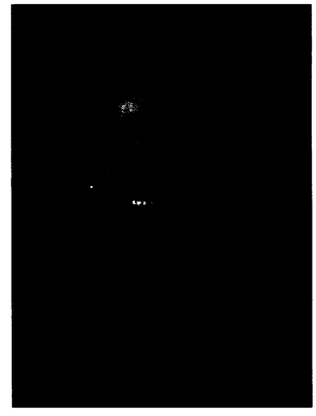
–Eliot Marshall

SPACE

NASA Plans Major Science Overhaul

The sweeping plan laid out last week to streamline the National Aeronautics and Space Administration (NASA) contains a little-noticed blueprint for dramatically changing the way the agency conducts research. NASA Administrator Daniel Goldin wants to create half a dozen institutes run by universities or companies at the agency's sprawling complex of centers. The move will improve the quality of NASA's scientific efforts, he says, although it will not save money.

Goldin's announcement allowed researchers at some NASA labs to breathe a sigh of relief: An internal NASA white paper leaked in February proposed reducing, consolidating, and eliminating science-related work at several centers (*Science*, 3 March, p. 1259). But France Cordova, NASA chief scientist, and other science managers argued that scientific expertise must be maintained at or near the centers. Their recommendation was ultimately incorporated into the plan, announced last week, that would eliminate almost 4000 jobs at the agency and save $5 billion without seriously hurting science, according to Goldin. "These institutes are not going to save a nickel," Goldin said at a press briefing on 19 May. "But they will make for much better science at NASA." Goldin vowed to improve peer review and the quality of science at the agency, which has been criticized by Congress and some researchers. Added Cordova: "We want to be more open, more responsive, and to invite in the community."



Instituting change. France Cordova promotes a novel structure to improve NASA research.

Cordova said the proposed new institutes would draw on such models as the Scripps Institution of Oceanography, run by the Univer-