

David Packard, chairman of Hewlett-Packard, and D. Allan Bromley of Yale University, also warned that the recommendations should be adopted as an "integrated package." It went on to say, "Were they to be only partially or selectively implemented, they could result in significant damage to the academic enterprise."

**'Capricious.'** The situation boiled over last spring. The Office of Management and Budget issued its intention to revise Circular A-21, which in effect regulates the administrative-cost reimbursement rate, but when the research universities asked for more time to consider the change, OMB refused to discuss the matter further. Robert M. Rosenzweig, president of the Association of American Universities, called the action "arbitrary and capricious" and accused OMB of "abandoning any pretense" of working out a mutually acceptable arrangement.

For their part, OMB officials termed the academics "petulant and unreasonable" and sought to win friends in Congress and elsewhere by estimating that the government stood to gain \$100 million the first year the new rate went into operation and more than \$200 million the succeeding year. This money, they ventured, could be better spent on additional research grants than on administrative overhead.

The universities argued that they would have to find other sources for the overhead costs that OMB refused to reimburse. The change could require them to dig deeper into their own pockets. OMB, in AAU's words, was "ignoring a set of cost principles developed over the years and closely linked to the nature of our peculiar system of higher education." As AAU saw it, the government's accounting principles were being driven by budget pressures

## Love and need in academe

In the prolonged dispute over indirect costs of academic research, higher education has been represented principally by the Association of American Universities, which consists of the heads of 54 of the largest research universities in the US. At AAU's fall meeting on 19-21 October in Washington the academic leaders found little levity in their current fiscal plight. During the discussion, William Danforth, chancellor of Washington University in St. Louis, depicted the situation as going from bad to worse. Universities, he wrote, may be characterized as

rich but needy,  
powerful but loved,  
able to pursue institutional self-interest  
but in a spirit of altruism,  
elite but of the people,  
effective but not professional;  
pure but politically astute and adept;  
economically successful but  
incorruptible.

The association's president, Robert M. Rosenzweig, thought of the limping meters as satiric doublethink and circulated it to friends with this blithe memo: "It will be greatly appreciated if members of Congress, their staffs, executive department officials and the press will take note and post in appropriate places." Needless to say, that's exactly what happened. —IG

rather than sound management principles and practices.

The impasse led to a series of OMB meetings with Dale Corson, the former president of Cornell who heads the Academy of Sciences's Government-University-Industry Research Roundtable, as well as with Packard and Bromley and with an assortment of academic leaders. On 9 June OMB produced another version of A-21. The new rule would allow 3% of "modified

total direct costs" for administrative activities of faculty investigators, department heads and professional research staff. It also abolished the onerous requirement for faculty effort reporting.

The proposed new rate still upset some of the major research universities. They claimed their costs were far greater than overheads at smaller institutions by virtue of their better research equipment and larger technical staffs. On their behalf, Rosenzweig met throughout the summer with David Kleinberg, an OMB deputy associate director. Finally, on 25 September OMB agreed to adjust the allowance to 3.6%, at the same time making it clear that reimbursement would not include costs for business or administrative professionals. As another concession to university researchers, the latest revision of A-21 says, "No documentation is required to support the allowance."

**Acknowledgments.** OMB's terse statement about the changes did not mention AAU, but called attention instead to the efforts of the Government-University-Industry Research Roundtable in helping resolve the problem and in seeking to improve the research administration environment. While implementing the new rules, OMB also noted, its auditors and an interagency group of senior research officials and Federal auditors would be reviewing the appropriateness of the 3.6% solution and possibly proposing "additional refinements to A-21 or related guidelines or rules."

The revisions are not likely to end all opposition to A-21. "Even at the slightly higher rate, some of the largest institutions will suffer hardship," says Rosenzweig. "We haven't reached the end of the dispute yet."

—IRWIN GOODWIN

## Deutch suggests ONR as model for a DOD research agency

The potential significance of the proposal wasn't lost on the audience in the auditorium of the National Academy of Sciences on 21 October. They had come for a symposium marking "Forty years of excellence" of the Office of Naval Research and heard a star-spangled cluster of speakers celebrate ONR's contributions to US science and inventions and science policy. NAS President Frank Press opened one session by hailing ONR for "establishing the model of a government patron of science" and was followed by Charles Townes of the University of California at Berkeley championing the agency for "the wisdom to support good scientists and good ideas."

Then came John M. Deutch, provost at MIT and a member of the Defense

Science Board, suggesting that 40 years was long enough for the Defense Department to establish a better way of supporting basic research in the military services. He proposed that ONR could be the centerpiece of an expanded new Pentagon operation that he called the "Office of Defense Research."

Deutch suggested that the agency might be modeled after the Department of Energy's successful Office of Energy Research. He has considerable knowledge of the DOE research office because he was its first director from 1977 to 1979. As Deutch envisions an expanded DOD research agency, it would have administrative authority over ONR as well as over organizations responsible for funding and conducting basic science in all the other military

services.

In each of the last few fiscal years, basic research in DOD's 6.1 budget category plus some applied research in category 6.2 has amounted to about \$1 billion—a sizable chunk of money that could supplement the research partnership between government and universities. Money alone has not been enough, said Deutch, to quell criticism in recent years that the Pentagon is wrongheaded in its support of basic research. There are charges that DOD is too narrow in its choice of proposals to fund, selecting only those with apparent military promise, over ones expected to yield new understanding and insight. Some members of Congress and the science communities fear that the Pentagon seeks to militarize

more academic research and detects in the Strategic Defense Initiative a heavy-handed way of doing this. SDI's Innovative Science and Technology program is seen as a way of redirecting research on campus to military purposes.

ONR, by contrast, has maintained a remarkably sound relationship with academic scientists since its origins out of Vannevar Bush's Office of Scientific Research and Development in World War II. In 1946 ONR was created by Congress, with the blessing of Bush and scientists from universities and industry, to support basic research. The key to ONR's success among academic scientists was in replacing the standard Navy procurement contract with a straightforward and simple contract to take on research and development without specific outcomes. ONR's contracts enabled investigators to submit unsolicited proposals for government support and to publish the results of their work. This system became the model not only for other military research agencies but for the National Science Foundation and the older National Institutes of Health.

In his remarks on ONR's 40th birthday, Deutch argued that any new research agency needed strong leadership. This was a lesson the Navy learned early, when it became, in 1959, the first government agency to appoint an assistant secretary specifically for R&D—James H. Wakelin, an industrial physicist with a PhD from Yale. Surely, said Deutch, a DOD-wide research agency needed at least an assistant secretary at its helm to give it proper prominence within the Pentagon hierarchy. Once the science operations of each of the services, including their laboratories and the Defense Advanced Research Projects Agency, are folded into the new organization, it should attain a critical mass that DOD basic research now lacks, he argued.

"It's fairly easy to identify some of the problems [faced by DOD research], but much less easy to know what to do about them," Deutch observed. Support of basic research at universities has increased more rapidly than any other part of the Federal budget except defense. "One might conclude from this that the climate in academic science is good. In fact," he cautioned, "the climate is awful and there are fears it will get worse."

**Problems.** Deutch defined three key problems: For one, the framework of basic research has changed, with sponsors more concerned about product technology than about knowledge and understanding of natural phenomena. Second, expectations of funding for basic science are lowered by mammoth budget deficits and demands to support other, more needy parts of society.

Third, respect for scientific research is waning in the nation, as evidenced by the persistent decline in the number of US college freshmen who intend to major in the physical sciences. "The matters I'm speaking about cannot be fixed by fiddling at the margins," Deutch said.

The situation is aggravated by renewed strains in the DOD-university relationship, he said. Telling evidence of this can be found, Deutch noted, in the "remarkable unanimity of campus opposition to 'Star Wars.'" Beyond this, he expressed dismay that many academic scientists refuse to accept SDI contracts or grants. "The sponsoring organizations have shown little ability to learn how to deal with the tensions between major performers and major providers."

**Restrictions.** Worse may come, according to Deutch. "All sorts of restrictions and regulations have been proposed for university research," he warned. These include strong limitations on technology transfer, open publication and supercomputer access. "In thinking of strategies for the future," said Deutch, "we cannot continue to do business as usual." Though he said he understood the disadvantages of a unified research agency in DOD, Deutch claimed he put forward the idea to encourage other types of organization.

The prospect of improving the operations of DOD's basic-research program in its own labs and through contracts and grants to universities and businesses couldn't come at a better time. Just about everyone, from President Reagan to business leaders and financial journalists, emphasizes the old saw that research makes the economy prosper.

Deutch's concept for centralizing the currently fragmented management and funding of DOD research is based on DOE's energy research agency, which had been promulgated in the early 1970s by scientists and congressmen who feared the still unborn Department of Energy would resemble its dominant parent, the Atomic Energy Commission. Despite its history of bomb building, AEC also operated such multipurpose research centers as Brookhaven, Fermilab and SLAC, which have strong university ties.

**Struggles.** Even so, plans for a research office did not appear in the original version of the bill to create DOE. Laden with baggage from AEC and the other agencies that made up the new department, old hands resisted any changes that might encroach on their territories. Into the turf battles came the scientific community, spearheaded by the Association of American Universities and the Office of Science and Technology Policy, then headed by Press, who seized the occasion to pro-

tect basic research. As the day approached to open DOE in 1977, a blue-ribbon group that included George Pake of Xerox and Wolfgang Panofsky of SLAC met in the White House Roosevelt Room with James Schlesinger, newly named as Energy Secretary, to work out the details of the research agency.

From the start the agency was expected to be more multidisciplinary and flexible than any other Federal research organization, though it bore some resemblance to both DARPA and NASA. Deutch acknowledged in his speech that when DARPA was conceived in 1958 it was to be a centralized research office dispensing 6.1 money to scientists and engineers in academe and industry. After the Mansfield Amendment to the fiscal 1970 DOD Authorization Act restricted Pentagon support of research to a "direct and apparent relationship to a military function or operation," DARPA's sponsorship was sharply curtailed. This led to criticism in scientific communities that DARPA and other DOD research groups limit their support to work that advances military technology.

**Honors.** When Deutch finished his talk, only a few in the audience spoke against the proposal. Townes, for his part, disputed the concept of a unified DOD Office of Defense Research on the grounds that science thrives best on a variety of support styles and a multiplicity of program managers. He considered his own early work on masers a high-risk venture that had no military connection at the time. Townes said he preferred adhering to the original charter of ONR: to allow investigators to pursue what they consider scientifically or technically most exciting. By keeping to this practice, ONR supported Townes in the research that led ultimately to his 1964 Nobel Prize in physics.

Indeed, the agency can take credit for backing some of the best and brightest. Among the speakers at the symposium were several Nobel laureates who, like Townes, were ONR grantees: Kenneth Arrow of Stanford University (economics, 1972), Leon Cooper of Brown University (physics, 1972) and Herbert Simon of Carnegie-Mellon (economics, 1978). It also boasted a home-grown talent, Jerome Karle of the Naval Research Laboratory (chemistry, 1985). In his case, said Karle, ONR put its money on the researchers, not on the proposals. "I'm not sure any other government agency would take that gamble," he said.

"We must be a little cautious in centralizing research too much," said Townes. "We have a system that is by no means perfect but continues to be the best in the world."

—IRWIN GOODWIN □