offers to purchase information from employees. "We also have good reason to believe there is infiltration by activists" going on not only at primate centers but at universities and pharmaceutical companies, says King.

McCarthy notes that all the major breakins to date have been "inside jobs." He says investigation showed that the recent seizure of cats from a Department of Agriculture laboratory was done with the help of insiders because the fences had been cut from the inside. "The best security is training your own people," he told the SCAW audience.

The animal activism of the 1980s appears to be a major historical phenomenon. McCarthy, a former Catholic priest who taught philosophy and political science, sees it as the successor to the antiwar and human rights crusades of the 60s and 70s. He also notes that modern animal rightists come from a quite different philosophical strain than the old-line antivivisectionists, even though the goal of both groups is the total elimination of animal use in research. Whereas the antivivisectionists operate from principles of humaneness and the idea that doing harm to an animal degrades a person's humanity, the rightists embrace the idea of animal equality—a philosophy that contains a strain from Eastern religions and carries "cultural relativism" to its ultimate extreme.

Noting that the rightists tend to be young, McCarthy thinks they are largely urban types who have never known any animals other than family pets. This, he thinks, has led them to anthropomorphize animals, with help from television programs that show them acting like people. This view gets some support from the fact that McCarthy says the one group he has not seen much protesting from are those who know animals most intimately—the farm community.

The movement has not yet plateaued, but McCarthy says he does not expect Congress will be passing any major new legislation. Rather, he says, policies will be worked out at state and local levels. Some localities, for example, have passed laws prohibiting the use of pound animals for research. And Cambridge, Massachusetts, which has already passed ordinances against the Draize test and the LD_{50} for toxicity testing (a move analagous to making a town a "nuclear free zone"), is now considering a law that would establish a city commission that would be empowered to review painful experiments, inspect research facilities, and even close laboratories. John M. Moses of the Massachusetts Institute of Technology, who described the proposed measure at the SCAW conference, said "no issue has attracted more letter writing in years." ■

CONSTANCE HOLDEN

Duke's Heart Center in Bureaucratic Jam

Duke got $14 million from NSF for an engineering center for cardiovascular research, but discovered it is contingent on co-funding from NIH

LAST March, the National Science Foundation (NSF) announced that it had "agreed in principle" to award Duke University $14 million to establish an NSF engineering center for cardiovascular research. Duke soon learned that its engineering center grant had an unusual string attached. Full funding, NSF officials reported, is dependent on Duke getting what amounts to a matching grant from the National Institutes of Health (NIH). If NIH money is not in the pipeline by next September, the 5-year, $14 million center at Duke will be shut down early.

"As of now, our present position is that if they cannot get NIH money the whole thing is over after this year," Marshall M. Lih, NSF director of cross-disciplinary research said recently. His stated position goes even beyond the strictures of the written agreement for the Duke center.

Duke researchers are stunned. Theo C. Pilkington, professor of biomedical and electrical engineering at Duke, has been negotiating with NSF through the spring and summer in the wake of NSF's co-funding demand. He was surprised by Lih's stark bottom line. "We expect this award to be made for the full 5 years and, I hope, for the maximum allowed, 11 years," says Pilkington.

NIH officials have not been happy from the outset with what appears to be a pressure play from NSF. NIH director James B. Wyngaarden recalls that NSF chief Erich Bloch approached him some time ago about a possible co-funding arrangement for the center, which represents a blend of engineering and medical research. But no agreement was struck.

"I indicated that I'd be willing to consider co-funding if I had a valid application [from Duke]," Wyngaarden said in an interview. "Duke would have to go through our valid review process. Having had previous conversations with [Bloch], I was rather surprised that the science board took that action." NSF officials sent Duke's engineering center application to NIH for its review.

On 1 April, Wyngaarden sent it back. "It is our recommendation that the NSF consider the application on its own merit without reference to possible co-funding by the National Institutes of Health," he wrote Bloch. "This recommendation is strongly influenced by the unilateral announcement by the NSF of conditional co-funding . . . ," said Wyngaarden, adding that the NSF co-funding demand was "particularly surprising" in view of President Reagan's budget request to increase NSF funding while decreasing NIH resources by 10%.

The unusual strings-attached grant to Duke was approved by the National Science Board (NSF's governing body) on 23 March when the Duke center for emerging cardiovascular technologies was one of three proposals the board selected from a list of 68 applications from 48 institutions. The board made commitments to the other two winners with no strings attached. An NSF center for hazardous substance control at the University of California at Los Angeles is slated to get $18 million over 5 years. A center for optoelectronic computing systems at the University of Colorado at Boulder was authorized at $14.5 million. Duke is expected to get one-third of its $14 million from NIH.

Apparently the interdisciplinary nature of the Duke cardiovascular center lies behind the demand that it receive NIH funding. Some of the officials responsible for this decision, including Bloch, have been unavailable for comment, but it is clear that the co-funding idea had support in the White House as well as at NSF. On 1 April, presidential science adviser William R. Graham wrote to Health and Human Services secretary Otis R. Bowen about Duke. "I view the Duke ERC [Engineering Research Center] as a natural opportunity to join the missions of the NSF and the NIH in our important national thrust to bring science and technology to bear on international competitiveness through centers," he said. "It is apparent that many benefits to NIH, NSF, and the country would be forthcoming if there were much closer cooperation between the agencies, particularly where engineering research and education activities may directly impact health care delivery."

Bowen replied 2 months later with a message like Wyngaarden's: to get money

from NIH, you must apply through established channels. "The application from Duke University was submitted to NSF in response to an announcement by the NSF that did not involve the NIH," Bowen added.

Last summer, state government officials in North Carolina tried to resolve the impasse by brokering an agreement with Duke and the North Carolina Biotechnology Center, a clearinghouse for research funds from various sources. The state-supported center pledged $1.6 million to the Duke-NSF engineering center over 5 years. In addition, industry has promised support and NIH already is funding cardiovascular research at Duke at a rate of more than $2 million a year in regular grant support. It all adds up, de facto, to the one-third co-funding that NSF is demanding.

But NSF has not agreed to see that as a compromise. "State money is something extra," NSF's Lih told *Science* recently. "It's nice, but it is not a substitute for NIH money." Said Lih, "Actually, the rationale of the NSF management's position to get NIH funding is to leverage other agency funding. That is why NIH money is specified."

For now, it looks as though Duke is prepared to move ahead without the full funding it originally expected from NSF. On 2 October, the university finally announced that it had signed an agreement with NSF to launch the Engineering Research Center for Emerging Cardiovascular Technologies. The announcement said that NSF will provide up to $9.33 million over the next 5 years, conspicuously leaving out the fact that at full funding the figure would have been $14 million. For the current fiscal year, NSF will advance Duke $667,000 to begin the center's operations—about half what it would get were NIH to meet NSF's demands.

The Duke center has until next September to get more NIH money. If it gets the full one-third support from NIH—that amount also works out to $667,000—NSF will provide a matching supplement. If NIH provides less than one-third, NSF will contribute proportionately less. Pilkington says that Duke has now made formal application for new NIH money that would go to research "closely related" to the center's planned program.

In any case, Duke has every intention of moving ahead with its research aims, which include a new generation of implantable cardiac devices, such as defibrillators, and real time, three-dimensional diagnostic ultrasound imagery of the heart. ■

MONTE BASGALL

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SDI Experts Clash On Nuclear Satellites

Taking a shot at critics of SDI, Lowell Wood seems to have knocked out instead the rationale for a space-based reactor

LOWELL Wood, a senior scientist at the Lawrence Livermore National Laboratory and a leading supporter of President Reagan's Strategic Defense Initiative (SDI), has been firing verbal volleys at SDI critics but may inadvertently have hit the wrong target: a key program to develop nuclear reactors to power SDI satellites.

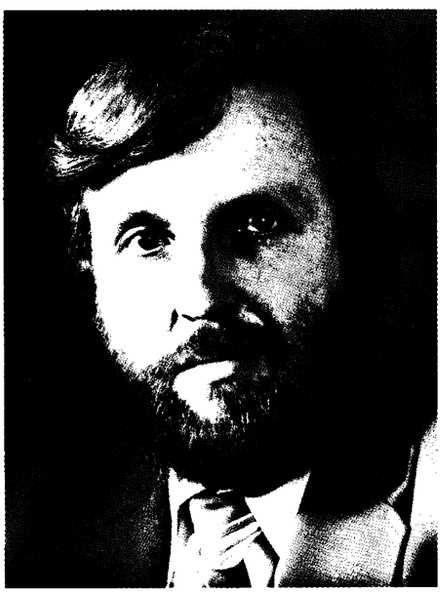
Some SDI critics have argued that providing sufficient power to operate strategic defense satellites will be a major problem, requiring small nuclear reactors that lie well beyond the current state of the art. Since such reactors will take many years to develop, the need for them could delay SDI deployment.

These arguments received support earlier this year from a high-powered committee established by the American Physical Society (APS) to evaluate the state-of-the-art of lasers, particle beams, and other so-called directed energy weapons. The committee said that many SDI satellites would require between 100 and 700 kilowatts of "housekeeping" power in peacetime, and that about 100 nuclear reactors would be needed as part of a strategic defense system.

Wood claims, however, that the weapons platforms currently under consideration by the SDI Office need so little power that solar panels could do the job. Futuristic reactors are not essential, he says.

In hearings held in mid-September by a House armed services subcommittee, Wood lambasted the APS report, claiming that the 100- to 700-kilowatt figure was a product of the committee's "collective imagination." The committee was briefed by SDI officials on satellite power needs he said, and "they had been informed that housekeeping requirements were at most 15 kilowatts for all the systems under serious consideration, and were under 50 kilowatts even for platforms not at the forefront of consideration."

This came as a surprise to some members of Congress, because they have been assured by the Department of Energy and SDI officials that space-based reactors are essential for SDI. Congress has been approving funds for a multimillion dollar program in DOE to develop space reactors in part on that basis. For 1988, DOE has requested $70 million to develop a reactor called SP-100, more than 150% over the 1987 budget.



Lowell Wood. *Testified in September that nuclear-powered satellites are not needed.*

Representative Edward Markey (D–MA), a critic of SDI, promptly wrote to Energy Secretary John Herrington asking him to explain why he has been telling Congress that the program is needed to meet SDI power requirements when a senior SDI scientist says the Pentagon's own studies show that it is not.

On 28 October, Joseph Salgado, Herrington's deputy, responded with a letter stating that the department takes "strong exception to Dr. Wood's claims." Salgado said there are no documents that specify that all housekeeping power requirements will be below 15 kilowatts. "There may be some people who have the same view as Dr. Wood . . . but the official documents provided to us and the decisions made in concert with the director of SDIO [the SDI Office] indicate that higher power levels are required."

Salgado said in detailed answers to questions Markey posed that "to the best of the department's knowledge, present SDI studies indicate a range of power requirements from a few 10's to over 100 kWe [kilowatt