ine, members of the National Research Council panels as well as members of the academies [of Science and Engineering] have varying persuasions concerning the President's proposal," Philip Smith, the Academy's executive officer, told the Pentagon in a letter last June. "Thus we are unable to identify those who might be interested in participating in the assessment." Officials in the White House science office were angered by the Academy's response, but Smith writes this off as "the kind of reaction you get from government officials who are swept up in a particular program."

Keyworth says his own role in the study was largely to "keep reminding people what the President's objective was in his speech. Our primary concern was to make sure that all corners of the technical community were identified for contributions, to see that no stones were unturned. But our secondary concern was to see that the sentiment behind and the words of the President's speech were kept up front as a goal, because it is so easy for people to forget they are responding to a presidential initiative. I guess I spent a good part of the past 7 months reminding people of paragraphs and handing out copies of the original speech."

> The significance of the two reports is said to lie in the fact that the authors failed to detect any invincible technical obstacles that could prevent attainment of the President's goal.

Keyworth believes that one of the most important results of the study is the development of an integrated defensive weapons program to replace a somewhat haphazard collection of lesser efforts. "Before we didn't have a mission, really. We didn't know whether we wanted to do hard-site missile defense, we didn't know whether we wanted to do antisatellite weapons, we didn't know if we wanted to do the antiballistic missile mission, or what phase of intercept we wanted." All this has now been changed. "The President stated the objective in his speech, and he called for a program to meet that objective." And a program is what he will have.

Keyworth emphasizes the study's conclusion that there is no antiballistic missile technology "that you know so much about that you can either dismiss it or move it to the top." But he asserts that several of the technologies—such as a ground-based excimer laser capable of serving in its initial form as an antisatellite weapon—can be demonstrated by the end of the decade. "Now, such a demonstration would *not* demonstrate a workable ABM system. But, quite frankly, if I were a Soviet planner, I would quickly put two and two together and realize that an important part of the technology for an ABM system was well in hand and that development was more a matter of time than breakthroughs at that point. Such a demonstration would pressure the Soviets to take our arms reduction proposals much more seriously than they do now."

At a minimum, the report indicates, the development of a feasible antiballistic missile system may require construction of an enormous new rocket capable of lifting heavy objects into space, as well as a continuous manned presence in space. More than 100 new satellites would ultimately have to be deployed, as well as thousands of ground-based missile interceptors. The research program will be organized so that a decision on early demonstrations can be made in 1987 or 1988.

Like others in the Administration, Keyworth is skeptical about the wisdom of studying or developing a defensive weapons system jointly with the Soviets. (A proposal along these lines was recently made by Edward Teller and Eugenij Velikhov, a high-ranking member of the Soviet Academy of Sciences.) "I'm very skeptical about our ability to ensure that it's a mutually beneficial cooperative venture. Would they be taking all and giving nothing? I believe that the United States could—if we possess the resolve to do this—do it before the Soviets, in a meaningful way."

It remains to be seen, however, whether the Administration can persuade Congress and the public that such an unequal achievement is a desirable goal. It would require forgoing, at the least, any substantive outer space arms control, and it would eventually necessitate renegotiation of the U.S.–U.S.S.R. treaty banning elaborate antiballistic missile systems. Administration officials insist that deployment of such a system—which may, as Keyworth suggests, give the United States nuclear superiority—need not be feared by the Soviets. But they will doubtless have a tough time getting the Soviets to go along.

—R. JEFFREY SMITH

Cambridge Voters Turn Down Weapons Ban

By a margin of almost three to two, voters in Cambridge, Massachusetts, have turned down a proposal that would have made it a crime to work on nuclear weapons within the city limits. The proposal was put to a vote on 8 November.

The size of the defeat was something of a surprise. Opinion polls taken 2 months ago indicated the measure would pass easily, but opponents turned public sentiment around with a hard-hitting campaign financed largely by contributions from corporations and the Draper Lab, which would have been forced to close or move out of Cambridge if the proposition were approved. Senior officials and several academics from Harvard and MIT also weighed in with statements opposing the ban (*Science*, 7 October, p. 28). Backers of the resolution have said that the opponents misrepresented the proposed ban, and they have promised to be back next year with a new proposal.—COLIN NORMAN

Businessmen Urge Major Cuts in Federal R & D

A group of businessmen has told the Reagan Administration that $45 billion could be saved over 3 years in outlays on research and development, if only the federal government were to run its R & D enterprise more like a private corporation. Total federal expenditure on R & D is now about $48 billion a year.

The group, a task force composed mostly of middle-level executives from the American Hospital Supply Corporation, General Foods, Beckman Instruments, Hewlett-Packard, and Honeywell, has sent a sheaf of recommendations to the President's Private Sector Survey on Cost Control, a business group headed by J. Peter Grace that is attempting to pinpoint government waste and overspending. The Grace commission is expected to forward the recommendations on R & D to the White House.

Many of the task force's proposed savings—such as elimination of federal funding for the Clinch River Breeder

Reactor—have already been identified by other groups that have turned in recommendations to the Grace commission, and they were not spelled out in the R & D report. The report deals mostly with planning and coordination of science and technology in the federal government, and the burden of its message is that the government is not very businesslike.

Take, for example, strategic planning. The report faults the major science agencies for failing to have clearly defined goals and plans for meeting them. This, the report argues, makes it difficult for agencies to drop marginal projects and causes them to fund a lot of work that is not directly tied to their missions. For example, it criticizes the stated mission of the National Heart, Lung, and Blood institute—"to advance the national attack against diseases of the heart and blood vessels, the lungs and blood . . . "—as being too nebulous, but does not say how it should be reformulated to get the corporate stamp of approval. Proper strategic planning, estimates the task force, could save $7.3 billion over 3 years.

How basic research fits into the task force's ideas about goals and strategic plans is not clear. It barely attempts to deal with basic research, except to note that the university-government relationship is strained by arguments about indirect costs. It recommends that a fixed indirect cost rate be adopted, thereby freeing the universities from the burden of detailed cost accounting and saving $387 million over 3 years.

Although the Grace commission is philosophically in tune with the Administration, it is unlikely to have much of an impact on R & D—especially during an election year when the Administration is expected to cast itself as a friend of science and technology.

—COLIN NORMAN

Agrigenetics to Go Public

Agrigenetics Corporation, a leader in genetic engineering research and its application to agricultural products, is planning to go public. The company, the seventh largest seed company in the United States, intends to offer 2 million shares of common stock in hopes of raising $37 million, according to a preliminary prospectus filed with the Securities and Exchange Commission (SEC) on 9 November. Agrigenetics says it will use the money solely to pay off the company's short-term loans which amount to $34 million and account for about half of Agrigenetics' total debt. The company intends to go public as soon as possible, pending SEC approval of its prospectus.

Agrigenetics, whose sales totaled $88 million in fiscal 1983, apparently is in a financial squeeze because of accumulated short-term debt and the loss of net income over the past 2 years. The company had to take out loans primarily because of needed capital, investments in research facilities and, to some extent, the acquisition of other companies. At the same time, the company's FY 1983 sales dropped 12 percent from $100.5 million during the previous year. The shortfall was caused by changes in the federally subsidized programs in agriculture and, as a result, the planting of hybrid corn and grain sorghum dropped. Seed sales for these two crops account for about 50 percent of the company's revenues.

The preliminary prospectus reveals that the current principal stockholders of Agrigenetics are two foreign companies. Atlantic Industries Limited, an affiliate of F. Hoffmann–La Roche & Company, owns 16 percent and the Rochschild Bank of Switzerland has a 13 percent share. The Kellogg Company, maker of cereal products, owns 6 percent of the stock. Agrigenetics has collaborative research agreements with F. Hoffmann–La Roche and Kellogg. Chairman of the board David Padwa, who founded the company in 1975, owns less than 2 percent of the stock. His salary is listed as $115,000 plus benefits.

According to the prospectus, Agrigenetics and its subsidiary, Agrigenetics Research Corporation, spent $19 million in research in FY 1983 and funded 200 scientists from universities and institutions in the United States and overseas. The company itself employs 45 Ph.D's. The bulk of the research is focused on the development of crops that are hardier and produce greater yields. The company currently produces seeds by conventional methods but is exploring genetic engineering techniques to achieve these goals and also to reduce production costs.—MARJORIE SUN

Kangaroos Defended

The Office of Endangered Species (OES) has been deluged with more than 100,000 pieces of mail since last March—the overwhelming bulk of it from women—protesting a proposal to remove kangaroos from the list of threatened species.

Kangaroos were originally listed as threatened under the Endangered Species Act because Australia did not know how many there were and had no management plan for them. A ban on imports of kangaroo hides was lifted in 1981, and last fall Australia, claiming that its 10 million kangaroos were now being managed and accounted for, petitioned to have them de-listed.

According to OES official John Paradiso, the OES has postponed action, pending more information from Australia. Meanwhile, wildlife protection groups have been generating ferocious resistance from the public. Much of it has also been spurred by a television documentary called "Goodbye Joey," made by Australian conservation groups, which depicts brutal butchering and torture of kangaroos.

According to Paradiso, kangaroos are regarded as extreme pests by cattle ranchers, who have often taken matters into their own hands. However, he says the government no longer permits this and instead licenses hunters to shoot limited numbers. He says the Australians claim the TV film was contrived.

Conservationists say it is unrealistic to think the government can control illegal killing so long as there is a demand for the products. They say a severe drought has drastically reduced the population, estimated at 36 million in 1980, and that one species, the gray kangaroo, may be endangered. Paradiso says the animals should recover, being remarkably efficient reproducers.

Asked if recent leadership at Interior had had any effect on the OES, Paradiso said no. He said that work was more difficult under President Carter because of the variety of analyses that had to accompany every action. But this Administration does not have a driving interest in endangered species, so the OES is left to itself.

—CONSTANCE HOLDEN