off and hard to predict. Thus, said the panel, "the vast majority of university research programs, whether basic or applied, should be subject to no limitations on access or communications." Research whose military applications are clear and whose secrecy is paramount should be classified.

But, said the panel, there are a few "gray areas" of research that have military significance yet should not be classified. If they were to be classified, universities would drop out of the programs and it is important that universities remain involved in these research areas. The field of microelectronics contains some of these gray areas, according to the panel.

In the rare cases where controls short of classification are desirable, the NAS panel suggests a system similar to the voluntary prepublication review that many cryptology investigators have agreed to. "One of the main features of our concern is to set the rules ahead of time," Corson says. The panel recommends that the government spell out in its contracts that researchers are expected to submit their papers to the contracting agency at the same time as they submit them to journals for publication. The federal agency would then have 60 days to comment on the manuscripts and suggest modifications. If the researchers refuse to modify their papers, the government would have the ultimate right to classify the work or cancel the contract. In addition, foreign nationals from certain countries—presumably the Soviet Union and Eastern bloc nations—would be prohibited from working on these research projects. But universities would not be expected to keep these foreign visitors out of classrooms, laboratories, or seminars.

The reason for these recommendations for controls on gray areas of research, says Corson, is that it is not the results per se but the know-how that Soviet visitors often seek. To get that know-how, they would have to work for months with their American hosts, side by side in the laboratory. "We are now being asked not to show them [the Soviets] our laboratories. We don't like that. But they cannot come and have government support to work in the labs for 6 months or a year," Corson says.

As for the systems now used to control the flow of technology to the Soviets, the panel found much room for improvement. There are overlapping and confusing regulations administered by the departments of Defense and Commerce whose implementations are far from clear. "The panel discovered, not surprisingly, that few people either inside or out of the government have a comprehensive understanding of the government's technology control effort," says Corson.

One of the first things that could be done to improve the current control system would be to streamline the Militarily Critical Technologies List, according to the panel. This is a 700-page list of technologies whose export the DOD attempts to control. The list is so enormous, says Corson, that "it is hard to imagine things not on the list. For example, high vacuum technology is on the unclassified part of the list. What is the purpose of that? There is hardly a research lab in the world that doesn't do high vacuum technology."

Technology transfer is a real and serious problem.

Another difficulty with the current control system is that there is a serious shortage of people who can assess which research should be controlled and which should not. "Wherever we turned, the agencies were short-handed and lacked people who were competent in depth in technical areas," Corson remarks. This personnel shortage is particularly significant in the processing of visa applications. At present, Corson notes, the government "can make judgments in only a small percentage of cases. If a Russian engineer wants to work in a particular field, [the visa processors] are not competent to decide whether the area is important or not important, whether the visitor can go anywhere or whether he should be restricted." The panel recommends that "serious consideration be given to increased staffing."

Now that the NAS panel has released its report, the next step is for the government to decide how to act on it. One question is whether the White House, through the Office of Science and Technology Policy, will play a role in implementing the panel's recommendations. "The question is whether the policy issue is of sufficient concern to elevate it to the White House level," Corson remarks. "I think it is. I think the problems are understood better at the OSTP level than anywhere else in government." The NAS panel has already briefed the intelligence community and the departments of State and Commerce on its recommendations.—GINA KOLATA

Scientists Meet with Pope on Nuclear War Danger

An international gathering of 57 scientists, including top officials of academies of sciences from East and West, on 24 September presented Pope John Paul II with a declaration on the prevention of nuclear war condemning nuclear weapons and the arms race.

U.S. National Academy of Sciences (NAS) president Frank Press was among scientists from Western, socialist, and Third World countries who signed the statement. They urged major powers to take a number of specific actions—notably foregoing the first use of nuclear arms—toward achieving the "ultimate goal of complete nuclear disarmament."

The meeting was held in the Vatican under the auspices of the Pontifical Academy of Sciences. John Paul encouraged the development of the statement in the latest of several instances of interaction with scientists on the issue since he established a permanent study group on the consequences of nuclear war in 1980 (*Science*, 26 February, p. 1076). The Pope visited the meeting to receive the declaration.

The declaration cites an unprecedented threat "arising from the massive and competitive accumulation of nuclear weapons," and warns that a major war could result in the "immediate deaths of hundreds of millions of people," and "trigger major and irreversible ecological and genetic changes, whose limits cannot be predicted."

Perceptions that the threat of nuclear war is increasing have prompted several efforts among scientists to muster an organized response. The recent declaration in Rome represented the confluence of two such efforts. The Pontifical Academy under its president, Carlos Chagas of Brazil, had worked independently on a statement on the immorality of nuclear war. In the United States, discussions of an international initiative on the topic were begun within NAS by its former president, the late Philip Handler, and then foreign secretary Thomas F. Malone, and was endorsed by Press when he assumed the presidency last summer. Talks with University of No-

tre Dame president Theodore Hesburgh led to contact with Cardinal C. König, Archbishop of Vienna, who was instrumental in bringing about the conference convened by the Pontifical Academy.

To enlist further support for the declaration, including that of other religious denominations, a followup meeting in Vienna in November is reportedly planned by Archbishop König.—***John Walsh***

PBS to Broadcast Soviet Program on Nuclear War

Last June, an estimated 100 million Soviet citizens saw six physicians from the United States and the Soviet Union discuss in an hour-long program the myriad horrors of nuclear war. Now, the unprecedented show will play on U.S. television, courtesy of the Public Broadcasting Service. The rare dialogue in June was arranged by the International Physicians for the Prevention of Nuclear War, based in Boston, and Soviet Ambassador Anatoly Dobrynin. PBS will rebroadcast the program on 13 October on a special segment of its *Inside Story* program.—***William J. Broad***

NSF Gets a Billion-Dollar Budget

The National Science Foundation (NSF) has emerged from this year's confused and hectic budget process in relatively good shape. Not only did Congress add $23 million to President Reagan's request for NSF, but it also approved the agency's budget a few hours before the fiscal year began on 1 October. Most other federal agencies will not have their budgets sorted out until December, when Congress returns for a lame-duck session.

Congress approved a total of $1.092 billion for NSF, an increase of almost 10 percent over last year's budget. The major point of departure from Reagan's proposal is in the support of science education. Reagan wanted to eliminate NSF's education programs, leaving only $15 million to fund fellowships, but Congress has bumped the figure up to $30 million. This should provide funds for programs such as precollege teacher training, public understanding of science, and the development of new undergraduate science courses. The House Appropriations Committee has recommended that programs designed to enhance opportunities for women and minorities in science be given a high priority in NSF's science education activities.

This is the second year running that Congress has blocked the Administration's attempts to gut NSF's science education programs. Last year, however, Congress took some money from research support to pay for education projects. This year, it has added to the Administration's request in both accounts. It has approved $1.06 billion for research and related activities, an $88 million increase over last year.—***Colin Norman***

Governor Brown Vetoes Gene-Splicing Bill

A bill to regulate recombinant DNA research in California sailed through the state legislature during the summer and landed on Governor Edmund G. Brown, Jr.'s desk in late August. It remained there for a month, evidently causing him some discomfort. On the one hand, the measure was billed as helping to protect human health and the environment, two things Brown says he cares a lot about. But on the other hand, opponents of the bill were telling him that it could adversely affect high-technology industry in California, another thing he has embraced with a passion. On 30 September, he vetoed the bill.

According to an aide, Brown was persuaded that the legislation was unduly restrictive and could have opened up biotechnology companies to a lot of spurious litigation. In short, the bill would have accomplished two things. State agencies, including the university, would have been required to follow the National Institutes of Health (NIH) recombinant DNA guidelines. And in any litigation involving alleged harm from recombinant DNA research, the burden of proof would be on the defendant to show that the NIH guidelines had been followed. It was this latter provision that worried biotechnology companies. Brown received some 20 letters and telephone calls from company officials warning that it would invite a lot of lawsuits and require excessive record-keeping. Several biotechnologists threatened to take their companies out of California if the bill became law.

Governor Brown

Sponsors of the bill are somewhat bemused because all this opposition surfaced after the measure was passed by the legislature. Right now, they are uncertain whether to try to override the veto, or work out a compromise bill next year.

—***Colin Norman***

The Breeder Lives

By a margin of one vote (49 to 48) the Clinch River breeder reactor escaped an attempt to kill it in the Senate on 29 September. The test came during a vote on a temporary financing bill that would keep all federal programs going at present funding levels through 22 December. Preoccupied with tax and budget bills, Congress failed to vote on regular appropriations before the recess. Most of the appropriations bills have been postponed for consideration in late November, when Congress will return for a lame-duck session. The breeder will come up again for review at that time, and there will probably be a second attempt to kill it.

There was an irony in the vote taken last week. All three senators who were absent voted against the breeder when it came up for review in November 1981. Had they been present this year, they could have eliminated the project. The absentees were Max Baucus (D–Mont.), Edward Kennedy (D–Mass.), and Spark Matsunaga (D–Hawaii).—***Eliot Marshall***

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