it is clear that the university is selling, not receiving," Fusfeld said. "Several notable recent exceptions in biotechnology do not change the overall picture."

It is those notable exceptions, however, that are at the heart of the present public debate over the propriety of industrial sponsorship of university research. Representative Gore made the point in his prepared remarks. "While the increasing ties between universities and private companies in general give me some cause for concern, such arrangements involving biotechnology research have received special attention because of the uniqueness and power associated with genetic engineering," he said. Gore cited the recent Massachusetts General-Hoechst and Washington University-Monsanto contracts as being among those that deserve continued scrutiny.

". . . I do see several potentially negative aspects of these relationships that I think need to be fully debated. And in some cases, alternative arrangements need to be explored before these new arrangements set precedents that may be injurious," he said.

Among members of Congress, Gore has taken a particular interest in the academic-industrial complex. The House subcommittee on investigations and oversight which he chairs has held several hearings on the subject and reviewed a number of contracts in detail. "The subcommittee will soon be issuing its report," he said. "We concluded that faculty should not hold equity positions in commercial ventures that coincide with their academic endeavors," he reported. "We will recommend that 'middleman' mechanisms be further developed, such as the North Carolina Biotechnology Foundation, recently established by the state of North Carolina to accept industrial contributions for university-based research." And he stated the subcommittee's desire for a guideline-writing national conference in the "tradition of the first Asilomar gathering" at which guidelines for recombinant DNA research were drafted in 1975.

But it is clear from both the Pajaro Dunes and Philadelphia conferences that neither universities nor corporations are eager for national guidelines. Rather, both sides favor a pluralistic approach that takes into account the differing circumstances in which contracts are negotiated. To date, several major research universities have drawn up their own sets of guidelines covering such matters as patent policy, publication rights, and disclosure by faculty of their corporate ties. Most of them are hoping this will be sufficient.—**BARBARA J. CULLITON**

Congress Ducks the MX

Funds provide for test missiles only; decision on Dense Pack basing put off

The 97th Congress, faced with a difficult choice on the fate of the MX nuclear missile, decided at the end of December essentially to set the matter aside. After a fierce debate, it settled on a provision in the massive budget bill that neither sanctions the controversial missile nor does it irreparable harm. The language agreed to by House and Senate conferees ensures only that yet another acrimonious debate about the MX and its optimum basing mode will occur this spring.

President Reagan, in a statement on 21 December, said that the bill was disappointing because it failed to include $1 billion for construction of the first five operational MX missiles. He signed it anyway, however, because it provided funds for the production of 20 test missiles, some of which could be used as operational missiles, according to language added to the bill just before it was approved. The language "does enable us to keep to our schedule for initial deployment in 1986 once the Congress approves a permanent basing decision," Reagan said.

No firm conclusions about a basing mode were reached during congressional deliberations. Dense Pack—the system of closely spaced missile silos proposed at the end of November—failed to attract much support, despite aggressive promotion by George Keyworth, the White House science adviser. Keyworth made a number of claims on behalf of Dense Pack that were contradicted by other Administration experts and consultants, and may have added to the confusion.

Keyworth told a Pentagon press conference, for example, that a system of ballistic missile defense to protect Dense Pack will not be needed until after the year 2000. When a reporter noted that even the Air Force acknowledges the need for a missile defense by the mid-1990's, Keyworth said, "Then I fundamentally disagree with the Air Force." Keyworth also asserted that the MX, when deployed in Dense Pack, would survive for "many, many hours," a viewpoint challenged by several experts. William Nierenberg, a member of the Defense Science Board, says, for example, that the MX would probably survive for 2 hours and certainly no more than 3 hours. Finally, Keyworth said that he does not believe the MX would "subject Soviet defenses to a threat that reduces their deterrent." To the contrary, Air Force General James McCarthy recently testified to Congress that with the MX in Dense Pack, "we put hard targets [such as Soviet missile silos] at risk which is the principal reason why we need the MX missile."

Congress tried to sort through the technical aspects of Dense Pack, but ultimately gave up. It approved the expenditure of $215 million for missile basing research but withheld another $560 million until spring, when a final decision is to be made. The Air Force says that this provision does not inhibit its work at all because the extra money will not be required before then anyway. The value of the deferral was apparently to provide the opportunity for a symbolic expression of fiscal restraint.

Instead of resolving the confusion itself, Congress ordered the President to produce another missile basing report, no earlier than 1 March. The report is supposed to address in detail the merits and drawbacks of Dense Pack, as well as to reconsider a host of basing alternatives that have been circulating for the past 15 years. Congressional advocates of road-mobile, multiple protective shelter, land-and-sea, deep underground, and submarine basing succeeded in attaching these ideas to the list of required topics. The President is also to examine the prospect of a missile larger or smaller than the MX. To help in this endeavor, Reagan has appointed yet another panel of experts—this one composed mostly of former government officials. The panel, which must complete its work by 18

February, will be chaired by Brent Scowcroft, President Ford's national security adviser. It includes Harold Brown, Secretary of Defense in the Carter Administration, and Reagan's former Secretary of State Alexander Haig, Jr. Charles Townes, a physicist from the University of California who chaired two previous panels on the MX, has not been invited to serve on the new panel. He concluded about Dense Pack that "the Soviets may have appropriately modified their weapons—for an effective attack on it—almost as soon as it is fully deployed."

Once the experts have reported and the President has supplied Congress with additional details, Congress will have roughly 45 days to approve or disapprove a missile basing mode. If it approves, the Air Force will quickly begin test flights over the Pacific.

Some members of Congress anticipate that the MX will be strangled by the basing dilemma. They argue that any alternative to Dense Pack will require more money, and they note that even conservatives are beginning to be wary about spending billions and billions of dollars on a weapons system that contributes only marginally to the total number of U.S. warheads (the General Accounting Office recently said that by 1996 the MX would account for between 5 and 13 percent of U.S. strategic power). Representative Carroll Hubbard (D–Ky.), who is known as a defense hawk, told the House during the recent debate that "right or wrong, the words 'here come the Russians' nowadays do not scare Kentuckians half as much as 'here come the creditors.' "

Others in Congress predict that concern about the basing mode will greatly diminish if it appears that this issue could become an obstacle to building the MX at all. Overall, sentiment is in favor of the MX. Representative Joseph Addabbo (D–N.Y.) and Senator Ernest Hollings (D–S.C.) both campaigned against the MX last December. Yet they signed their names to the House-Senate conference report on the MX, which pledges "a firm commitment to modernization of our strategic forces." Three members of the Joint Chiefs of Staff and several top White House advisers have indicated that they would be satisfied by deployment of the MX in existing, highly vulnerable Minuteman missile silos, arguing essentially that the missile's size and capability make it worth having at any cost. Selling this viewpoint on Capitol Hill may be essential to the survival of the MX in the next Pentagon budget.

—R. JEFFREY SMITH

A "Euro-Brookings" Enters the Lists

After an on-again-off-again start, a European version of an American-style think tank on economic and social policy has begun operations. The Belgium-based Center for European Policy Studies opened with an inaugural conference before Christmas.

The initiative for the center dates back to the mid-1970's when then Ford Foundation president McGeorge Bundy proselytized European officials on behalf of a think tank modeled on the Brookings Institution in Washington. The European Commission, the European Community (EC) executive, embraced the idea of a government-financed research institute (*Science*, 23 February 1979, p. 727), but intergovernmental negotiations dragged and the project foundered when the newly elected Thatcher government in Britain declined to participate after deciding that European cooperative activities were costing too much.

Proponents of a "Euro-Brookings" managed to revive the idea by proposing that startup funding come from nongovernmental sources. Some $500,000 was raised to establish the center, including a $225,000 grant from the Ford Foundation to be paid over 3 years, and grants from several European private foundations. The center will operate from offices in central Brussels and Louvain-la-Neuve—the site of the francophone segment of the bifurcated University of Louvain—outside the Belgian capital.

Originally conceived as comparable to Brookings in size, the center is expected to operate initially with a budget about a quarter that of Brookings' roughly $10-million-a-year funding. The center will have a small core staff and recruit researchers from European universities and research institutions to work on center projects.

Director of the center is Peter Ludlow, a University of London economic historian who also has been associated with the European University Institute, the EC-sponsored graduate school and research institute in Florence.

As in the original plan, the center will set its sights on problems common to all Western European countries with the idea of gaining the participation of other nations besides those in the EC and NATO. Although operating on a smaller scale than Brookings, the center proposes an agenda of studies on economic, social, environmental, and security problems similar in breadth to Brookings'. One center project is to be a periodic survey of European national budgets resembling the Brookings series on setting U.S. national priorities.

The center is committed to independence in choosing its own research topics and operating outside the structures and strictures of government. And it has taken the first successful steps toward becoming self-supporting. But European business and government are unaccustomed to such independence and the center will have to persuade potential clients of the value of supporting research projects they don't control.—JOHN WALSH

Princeton Physicists Meet Tokamak Deadline

It came down to a race with the calendar, a feverish attempt to beat the coming of the new year. And it worked. At 3:06 a.m. EST on Christmas Eve 1982, after 7 years of planning and construction and an expenditure of $314 million, researchers at the Princeton Plasma Physics Laboratory successfully inserted a hydrogen plasma into the Tokamak Fusion Test Reactor (TFTR).

The event was immediately hailed as a milestone. TFTR is the first of a new generation of tokamak reactors. Along with its brethren now under construction in Europe, Japan, and the Soviet Union, it is expected to attain the long-sought goals of energy breakeven and plasma ignition by the end of the decade. In practical terms, however, the Christmas Eve event was largely symbolic. Princeton's contract with the Department of Energy specified first plasma in 1982, so 1982 it was. The real physics will come at a more measured pace. The first plasma was hardly heated at all, for example, and as expected, it lasted only 50 milliseconds. Experiments with ohmic heating, the simplest method, will not begin until March: researchers will induce electrical currents in the plasma and allow the plasma's resistivity to