the Pentagon that the Soviet Union might ultimately develop an effective defense against American ICBM's and SLBM's. In such an eventuality, two of the major forces making up the U.S. deterrent "triad" of land- and sea-based missiles and bombers would be neutralized, with only the bombers having a chance to penetrate to Soviet targets. This dismal scenario always began with a Soviet first strike to eliminate the U.S. bombers and weaken the missile forces to prevent them from overwhelming Soviet defenses.

The U.S. response was to continue development of its own ABM and also to push development of the MIRV. For the MIRV, this was a new role, inasmuch as this system was first begun in the early 1960's to provide a relatively cheap way to attack increasing numbers of Soviet military targets. Now MIRV was being sold as a means of overwhelming even the most sophisticated ABM systems. Moreover, this could be accomplished cheaply compared to the huge outlays necessary for any ambitious missile defense.

Secretary McNamara, not wanting to intensify the arms race and aware that an American missile defense would be no less vulnerable to MIRV's than a Soviet system, kept delaying from one budget year to the next any decision to deploy the ABM, even though it would be a vast improvement over its Soviet counterpart.

The U.S. deployment decision came after Premier Kosygin's refusal at Glassboro in June 1967 to begin talks to limit strategic arms, including antimissile systems. McNamara had done all he could to arrest the momentum toward deployment. He had even arranged for President Johnson to meet with current and past White House and Pentagon science advisers to show that none of them believed an effective defense against a Soviet missile attack was possible. Now, going along with a presidential decision to deploy the ABM, McNamara announced it as a "Chinese-oriented" defense even though its characteristics would be indistinguishable from the beginnings of an anti-Soviet defense.

Eventually, Soviet leaders, perhaps influenced by intense public debate in the United States over the ABM, saw the need to limit ABM deployment. The 1972 treaty was the result. But, several years before, deployment of MIRV's began on a big scale, in the Minuteman III and the new SLBM, the Poseidon. Today, with some 800 missiles already thus equipped, the de-

Briefing

White House Presses New Energy Strategy

As the 102 neophytes of the 94th Congress went about memorizing the meaning of the bells and locating the rest rooms, the Ford Administration began an intensive campaign to sell its complex package of economic and energy policies that were announced piecemeal before, during, and after the State of the Union message on 14 January. The Democrats have yet to detail their counterproposals, but indications are that their approach to reducing oil imports will be fundamentally different, relying not on higher prices and market forces but on imposed shortages managed by fuel allocations. Just when a national energy policy might actually be cast into law, and what form it might finally take, is anyone's guess.

The Administration's energy proposals fall into three categories: short-term (now to 1977), intermediate (now to 1985), and long-range (1985 and beyond). The immediate objective, stated last October, is to lower oil imports a million barrels a day by the end of this year and another 1 million barrels by the end of 1977. This is expected to hold imports to below the 1973 level of 6 million barrels a day. Of the slightly more than 2 million barrels a day to be saved, 1.6 million barrels would be saved by reducing demand, through new tariffs and fees. In the next 3 months a sliding tariff on imports would reach $3 per barrel, boosting the cost of imported oil to more than $14 a barrel, well above the world price set by the exporters' cartel. Remaining price controls on "old" domestic oil would be removed, and a $2-per-barrel excise tax would be placed on all domestic oil. Also part of the proposed tax package is a levy on natural gas of 37 cents per thousand cubic feet (the energy equivalent of $2 per barrel of oil). This, along with "deregulating" the wellhead price of gas, is seen as a way of encouraging exploration and discouraging inefficient uses, as in power plants.

Another 600,000 barrels a day in imports could be saved, the Administration believes, by opening up naval petroleum reserves in California and later in Alaska and by encouraging power plants to switch from oil to coal.

The Administration says that all of this will raise the consumer price index by 2 percent in a single jump, but "with exceptions in some areas" should not add materially to inflation. Democratic critics, among them Senator Henry Jackson of Washington, believe that the impact of such broad levies on oil and gas will be much larger, and hence they are prepared to block them.

A proposal to increase automobile efficiency by 40 percent—that is, to average 19 miles per gallon in 1980—in exchange for a 5-year freeze on emission standards also is going to be hard to sell. Environmentalists are predictably opposed, and some analysts, like former energy chief John Sawhill, agree that so long a freeze is unjustifiable; a compromise of 1 to 2 years is possible.

By 1985, according to the Administration plan, a combination of reduced demand, increased offshore oil production (of 1.5 million barrels a day), opening the naval petroleum reserves for military needs, and production of small amounts of synthetic oil would result in a consumption level just under 20 million barrels a day. Of this, 4.7 million barrels would be imported, but would be replaceable temporarily by emergency conservation measures and a 1.3-billion-barrel national stockpile.

Imports thus would fall from one-third of present needs to one-fifth, while consumption would rise by about 1 million barrels a day from the current level. Overall, the White House envisions a 3 percent annual growth in U.S. energy consumption between now and 1985 with increasing reliance on coal and nuclear power. This contrasts with a widespread belief that the United States could hold itself to a 2 percent growth rate and remain economically healthy (*Science*, 10 January).

ployment continues, even though there is no longer the prospect of a significant Soviet missile defense. And for their part, the Soviets too are believed to be deploying MIRV's, although their MIRV program remains far behind the U.S. effort.

It now appears that MIRV has assumed the rationale that some strategic planners envisioned for it a decade ago —that of a "counterforce" weapon that can be directed in large numbers at enemy missile silos. But there is much confusion inherent in the counterforce doctrine. It implies a first strike, for otherwise the silos targeted would be empty when hit. Yet no sane national leader on either side will strike at enemy silos when the certain consequence would be a devastating retaliatory blow by the enemy's sea-based missiles. Thus, MIRV, as a counterforce weapon, appears to be both a costly redundancy and a pointless source of insecurity for the superpowers' land-based deterrents.

As many arms controllers were saying at the time, the chances of stopping MIRV began to fade in August 1968 when the United States began MIRV tests. Once the United States had bitten this particular apple of knowledge, the Soviet Union would insist on tasting of it too. Nevertheless, the decision to test MIRV was not even treated as a matter of presidential importance—it went no higher than the office of the Secretary of Defense, then occupied by Clark Clifford.

So, this is where the arms race stood in the early stages of SALT—more and more missiles, a declining interest in the antimissile, and a rising interest in the MIRV's once intended to cope with the antimissile. The fruits of nearly three decades of sporadic arms control negotiations had done nothing —though the ABM Treaty was near and would make an important exception—to stop the buildup of strategic weapons.

There had been the agreements never to deploy strategic weapons in Antarctica, in outer space, or on the seabed, plus a Nonproliferation Treaty of uncertain efficacy. But what all these agreements had in common was that they interfered not at all with the active programs or ambitions of either superpower, nor did they alter political perceptions as to which superpower was favored in the strategic balance. It would remain for the SALT negotiators to try to reverse the ominous tide of events.

—LUTHER J. CARTER

Briefing

Largely obscured by the complex tax and tariff proposals is a plan—still vague in detail—to launch what the White House calls a Synthetic Fuels Commercialization Program. As the name implies, the object would be to bring existing technology for oil shale and coal conversion across the threshold to commercial status. The goal is to have some 20 shale and coal gasification and liquefaction plants turning out the equivalent of at least 1 million barrels of oil a day by 1985. The key to the program would be a package of economic incentives to industry, possibly including price guarantees, purchase agreements, or other subsidies, all designed to protect a fledgling synthetic fuel industry from a decrease in world oil prices that the Administration continues to foresee in the next several years. Broad legal authority to grant such incentives is already on the books, but the White House is asking for additional authority to use tariffs, import quotas, import price floors, and other means of coping with sudden fluctuations in world oil prices.

As for energy R & D, Ford is promising to maintain the $11 billion program begun under President Nixon. In a ceremony on 15 January activating the new Energy Research and Development Administration, Ford said the new agency "won't be lacking adequate funds," but he added, "we expect some exciting things."—R.G.

Nuclear Advocates 34, Opponents 8

If the strength of an argument can be measured by the number of bishops who line up behind it, then the case for nuclear power won hands down last week in Washington in a flurry of manifestos and press releases.

First came an energy policy statement signed by 34 prominent American scientists, 11 of them Nobel laureates, declaring that the gravity of the energy problem and the difficulties posed by exotic alternative technologies leave the United States with no choice but to press ahead with developing nuclear and coal resources. Written mainly by physicists Hans Bethe and Ralph Lapp, the 750-word statement said, "the U.S. choice is not coal or uranium; we need both. . . . Nuclear power has its critics, but we believe they lack perspective as to the feasibility of nonnuclear power sources and the gravity of the fuel crisis."

All energy sources involve risks, and nuclear power is no exception, the statement continues. But it expresses confidence that technical ingenuity and careful operation of nuclear plants can preserve a largely unblemished safety record.

Bethe and Lapp presented their statement in a news conference on 15 January in which Frederick Seitz, the president of Rockefeller University, and Richard Wilson, a Harvard physicist, also took part.

Toward the back of the audience of 100 or so, consumer advocate Ralph Nader listened quietly. When it was all over, Nader took the occasion to release a broadside of his own, a letter to President Ford criticizing his decision to speed up nuclear plant licensing. Nader's letter said that more effort seemed to have been spent building plants quickly than in building them safely; the letter was signed by eight scientists, five of them Nobelist laureates.

In the meantime, the Federation of American Scientists, whose sponsors and council members include an even mixture of signers of both tracts, has begun a two-part analysis of the nuclear controversy in the monthly FAS newsletter. An introductory statement observes that between the advocates and the critics there exists a moderate school of thought which "sees dangers everywhere, certainty nowhere; for it, prudence includes maintenance of a vigorous sector of fission power until such time as at least one major nuclear accident certifies that the opponents were right." The statement goes on to say, "This view sometimes [holds] that the opponents of nuclear power are now as sensational as the proponents were dogmatic."—R.G.