Navy R&D: Will Congress Have the Nerve to Spear Trident?

Congress is currently trying to hold its own against an Executive Branch that is asserting itself with a vigor seldom equaled in the past. Presidential vetoes are frequent and impoundments of congressionally appropriated funds come thick and fast; entire programs in the social welfare field are abandoned or cut back; and, amid charges of White House complicity in the Watergate affair, an immunity for White House aides from congressional interrogation is asserted.

One of the areas where the Congress has shown itself to be weakest vis-à-vis the Executive has been in matters of military policy. Yet there is no question about the congressional power of the purse over the military. Furthermore, now at the close of the longest and quite possibly the most futile war in American history, it is not unreasonable for the programs and goals put forward by the Pentagon to be viewed with a certain tentativeness and skepticism.

The problem seems to be, however, that, confronted with the special knowledge of the military professionals in their narrow fields of expertise, the Congress does not trust itself enough to overrule the military even on matters of broad and fundamental importance. Nowhere has this attitude been more clearly exhibited than on the question of whether, or how fast, to proceed with the most expensive strategic weapon system ever undertaken, the Trident missile submarine, now estimated to cost $1.3 billion apiece.

The Trident, taking its name from the three-pronged spear carried by the sea god Poseidon, is the designation given the Undersea Long-Range Missile System (ULMS), for which the Navy began detailed design studies several years ago. Last year, the Congress appropriated nearly $900 million for Trident, most of this to be used to begin systems procurement. In authorizing all of these funds, the Senate, working under some of the heaviest lobbying pressures ever mounted by the Pentagon and the White House for a weapon program, acted against the advice of its Armed Services Committee's research and development subcommittee. With some last minute changes of mind by senators in committee and on the floor, the Administration prevailed by an 8-vote margin. Now, with the Administration back again asking for another $1.7 billion, the year 1973 could be critical for those in Congress who want to stop or slow down the Trident program as it is now formulated.

It is not yet clear whether the Trident program will be strongly challenged again this year. If there is to be such a challenge, it will almost certainly come in the Senate—the House has never come even close to breaking discipline and opposing a large strategic weapon program actively sought by the Pentagon. As will later be explained, the circumstances that will attend congressional consideration of the Trident program are significantly different from those a year ago, with some of these working for the program, and some not.

SLBM's and the Nuclear Deterrent

For the Trident issue to be understood, it is necessary to appreciate fully the important place held by the existing submarine launched ballistic missile (SLBM) system, made up of Polaris and Poseidon submarines, in the nation's nuclear deterrent. The first Polaris submarine, the *George Washington*, carrying 16 Polaris missiles, went on patrol in the North Atlantic in late 1960. Designed in some urgency, this vessel was made up of the forward and rear halves of a nuclear-powered "attack" submarine (used for tactical warfare against enemy naval forces and shipping), with a missile section added in the middle. Yet, although not specifically planned from the keel up as a strategic missile submarine, the design of the original Polaris was, with some later modification, found acceptable for the entire fleet of 41 SLBM's built and deployed between 1960 and 1967.

The unique advantages of the SLBM system were recognized early both by military planners and by arms control specialists. First, there was nothing even remotely in view that could threaten the Polaris submarine, which is something that could not be said of either the existing bomber force or the large new force of land-based intercontinental missiles, or ICBM's, then being deployed. Bombers could be caught by surprise attack while still at their bases, this threat being only partially countered by airborne or 15-minute ground alerts. ICBM's could, at least potentially, be destroyed in their silos by a large force of highly accurate enemy warheads.

The Polaris was deemed virtually invulnerable by virtue of its mobility and concealment in an ocean environment that foils such conventional methods of reconnaissance as radar and infrared detection. Antisubmarine warfare (ASW), still at a primitive level of development even today, depends largely on sonar, used in both a passive mode (listening for the sound radiated by a submarine) and an active mode (transmitting pulses of sound and listening for the echoes reflected from the submarine). Under favorable sea conditions, passive sonar is said to be able to detect even a slow-moving submarine at ranges of up to 60 miles or so, but is relatively imprecise. Active sonar is better at fixing a submarine's location, but its range is only 10 to 15 miles at best. Also, the submarine being sought can hear the pinging of the sonar long before it comes within detection range.

Another point to be remembered is that the ASW operations directed against SLBM's are vastly more complex and difficult than those intended to frustrate a submarine threat against shipping or naval forces. In the latter case, the submarine must position itself somewhere in the vicinity of its intended targets, and, thus, run the risk of detection by ASW forces assigned to protect those targets. SLBM's, by contrast, are free to patrol over millions of square miles of ocean, having only to keep their assigned targets within range of their missiles.

Furthermore, it is not enough for ASW forces to try to detect and destroy a few of the missile submarines at a time, with the entire SLBM fleet ultimately to be destroyed by a process of attrition. *All* of the submarines must be destroyed almost simultaneously. If no more than one or two were to survive, even for an hour or less, they could deliver a devastating attack on

the enemy's major population centers.

The SLBM system has been attractive from an arms control standpoint precisely because it is invulnerable. The deployment of large forces of ICBM's potentially vulnerable to an enemy first strike can be destabilizing, for the reason that an enemy might fear that, in a tense crisis situation, those missiles would be unleashed in a preemptive strike. The SLBM system does not give rise to such fears because it could "ride out" a surprise attack and retaliate in a deliberate manner. Also, any attack made on sea-based deterrent forces does not visit destruction upon the U.S. mainland, as would attacks against bomber or ICBM bases.

Given its manifold advantages, the SLBM system has come to be regarded —in the Pentagon, in Congress, and among arms control specialists—as the most important element in the "Triad" of strategic offensive systems made up of SLBM's, ICBM's, and bombers. It is not surprising, moreover, that every effort would be made to keep the SLBM system up to date and able to counter any breakthrough in antiballistic missile (ABM) or ASW technology that might occur. To cope with the ABM threat, the United States in the late 1960's began—prematurely, some arms control people believe—installing larger missile tubes on 31 of the 41 Polaris submarines, enabling them to accommodate the vastly more potent Poseidon missile. The Poseidon, with a payload four times greater than that of the Polaris, can carry up to 14 independently targetable warheads (MIRV's) of about 50 kilotons each. The normal complement of MIRV's is said to be 10.

Prior to the start of the Poseidon conversion, the SLBM force consisted of 656 missiles, capable of attacking essentially that same number of targets (though most carried three warheads, not independently targetable, to be delivered in a shotgun pattern). With the conversion, which will not be completed until 1976, the number of missiles would not increase, but the maximum number of independently targetable warheads would grow to 5120—enough to ensure penetration of an ABM system far more effective than anything now in sight.

To cope with the seemingly remote possibility of a breakthrough in Soviet ASW capabilities, the Navy also began considering what further evolution of the SLBM system might be possible and desirable. There were several areas of potential improvement that could be explored, chiefly those pertaining to range of the missile and to the quietness and speed of the submarine. Let us look for a moment at each of these.

Missile range. The original Polaris missile, the A-1, had a range of only 1200 miles, but it was soon superseded by the A-2, with a 1500-mile range, and the A-3, with a 2500-mile range. The Poseidon also would have a range of about 2500 miles, although its range could be extended somewhat if the size of the payload were reduced. With each extension of missile range, the Polaris-Poseidon submarines were able to patrol over an increasingly wide ocean area and still remain within striking distance of their assigned targets—a submarine armed with the A-3 or Poseidon missile is able to patrol over an area of 15 million square miles.

Impossible Mission

By extending the range of the Poseidon from 2500 miles to 4500 miles, the ASW task might be made manifestly impossible. Furthermore, a 4500-mile Poseidon would allow missile submarines assigned to the Atlantic to go on station almost immediately after departure from their home port of Charleston, S.C., whereas, with the shorter range missiles, a voyage of several days between home port and the patrol area is necessary. Also, if the Navy should have to give up its foreign Polaris bases, at Holy Loch, Scotland, and Rota, Spain, it could do so with little loss of effectiveness.

Similarly, still greater freedom of SLBM fleet operations could be gained by extending the range of the missile to 6000 miles. This, however, would require development of a larger, extremely costly submarine. By virtue of its greater size, such a submarine could carry more missiles as well as larger missiles, but, as noted later, under some circumstances this is not an advantage.

Quietness. If an entirely new and larger submarine were built, it could be made to operate more quietly than current models and hence made less detectable. For instance, a natural circulation propulsion reactor could be used. On the other hand, submarines in the existing SLBM fleet are 5 to 10 decibels quieter than the early Polaris boats. Still further gains in quietness are said to be possible without the need to build a larger submarine.

Speed. If equipped with a larger propulsion plant, a new SLBM submarine would have greater speed with which to move out of areas where it is threatened with detection and to elude forces trying to track it. Also, a larger, quieter propulsion reactor would allow the submarine to patrol at a higher average speed and thus take advantage of the vast new expanses of ocean opened up to it by virtue of its larger missiles. On the other hand, just as the 6000-mile-range missile requires a larger submarine, so does the bigger propulsion system necessary for greater speed. Also, because a SLBM submarine must have a large midsection for its missiles, it cannot in any case match the speed of fast Soviet attack submarines that might seek to track it. Furthermore, as the submarine's speed increases, so does its noise, making it easier to find and making its own sonar equipment less effective in detecting hostile forces.

In 1969 the Navy began designing a big new SLBM submarine that would provide greater speed, quietness, and missile range. By the summer of 1971, this work was far enough along to allow Navy and other Pentagon officials to identify the available options. The "ULMS" submarine that had emerged from the design study was truly immense. Displacing 16,000 tons or more, it would be twice the size of the Polaris-Poseidon submarines and would ultimately carry 20 to 24 missiles of 6000-mile range.

The alternative to building the ULMS would be simply to build an extended-range Poseidon missile (EXPO) of 4500-mile range, which could be used in the 31 Poseidon ships through the 1980's. Rear Admiral Levering Smith, the officer then having overall responsibility for development of SLBM systems, was understood to prefer EXPO over ULMS, believing that, for the short run at least, EXPO would ensure the continued survivability of the sea-based nuclear deterrent, and would do so at comparatively modest cost. Furthermore, to proceed with EXPO would not foreclose the option to build ULMS. The EXPO missile would in any event serve as the first-generation missile for ULMS, should that submarine be needed.

As it happened, however, Admiral Smith was at cross purposes with one of the most influential men in the entire defense establishment, Vice Admiral H. G. Rickover, deservedly known as the father of the nuclear-powered submarine. Rickover had led in the development of the big, quiet new reactor for ULMS, and he felt that development of the new submarine should proceed forthwith.

Rickover seems to have been unim-

pressed by the fact that, if built in sufficient number to provide a striking power equivalent to that of the Polaris-Poseidon fleet—for this about 30 would be required—the ULMS submarine would be the most expensive strategic weapon system ever built. The first ten of these ships—and this is the number currently in the Navy program—would cost more than $13 billion, with missiles and support installations included. (The procurement cost of all 41 Polaris and Poseidon submarines and missiles, computed from the start of the program through fiscal 1974, is $14.4 billion.) Rickover has long expressed distain for cost-effectiveness analysis, and, in an appearance before the Joint Committee on Atomic Energy some years ago, he recalled how Pope Pius II praised a Florentine architect for concealing the truth about the cost of a new church and palace, for, had the architect done otherwise, these "glorious structures" would not have been built.

Although Rickover clearly exerted a major influence in the Administration's decision to proceed with ULMS, the critical influence seems to have come from the Russians. Alarmed by a faster than expected buildup of the Soviet Yankee-class SLBM force, Secretary of Defense Melvin R. Laird decided, with White House approval, not only that the ULMS should be built but that it should be built on an accelerated schedule, with deployment to begin in 1978 rather than in 1981.

It turned out that the ULMS—or Trident—proposal was to receive an unusually searching review in the Senate Armed Services Committee's R & D subcommittee. The then acting chairman of the subcommittee was Senator Lloyd Bentsen of Texas, formerly a member of the board of directors of a number of large companies engaged in defense work, including the Lockheed Corporation, the contractor for the Trident missile. Thus, Bentsen was no stranger to the esoteric world of strategic weapons systems, and Rickover and the other naval officers testifying about Trident underwent rigorous questioning. Bentsen and most of the others on the subcommittee finally concluded that R & D for a new SLBM system should continue, but that the only thing which should be deployed at the end of the 1970's was the proposed 4500-mile-range Trident I missile, to be used in the Poseidon submarines.

The subcommittee's report was never made public, but the points made with respect to the Trident are said to have included the following: (i) there is no immediately foreseeable ASW threat which the existing SLBM force could not meet, especially if refitted with the Trident I missile; (ii) the very long-term ASW threat is now so ill-defined that it could be a mistake to invest in a fleet of huge, $1.3-billion submarines which might prove to be the wrong answer to the threat, if and when it develops; (iii) indeed, should a major ASW threat eventually arise, to replace a 41-boat fleet of Polaris-Poseidon submarines with a smaller fleet made up wholly or in part of very large submarines might be the wrong response.

Trident and SALT

Other knowledgeable parties, both inside and outside Congress, also took a position against the Administration's Trident program. The group of senators and House members known as Members of Congress for Peace through Law (MCPL) issued an illuminating report on the Trident. Addressed in part to the Trident's implications for the Strategic Arms Limitations Talks (SALT), the report observed that the Administration had been acting in self-contradictory fashion, sometimes implying that Trident was a bargaining chip, but at other times extolling Trident as vital to the U.S. deterrent.

The Federation of American Scientists' Strategic Weapons Committee—made up of persons such as Herbert F. York (former director of Defense Research and Engineering) and Herbert Scoville, Jr. (formerly an official of the Central Intelligence Agency and the Arms Control and Disarmament Agency)—felt that the Trident was "politically motivated, strategically unnecessary, dangerously premature, and wasteful."

A new group, the Center for Defense Information, headed by Rear Admiral Gene LaRocque, a recently retired officer who has held important sea commands, issued a report entitled "ULMS: Too Much Too Soon."

A strong case was being made against Trident, but, besides the congressional habit of giving the military essentially everything it wants (give or take a new helicopter here or a new battle tank there), there were some special circumstances working in Trident's favor. Most notably, by the time the military procurement bill came before the Senate late last July, President Nixon had returned from Moscow with an ABM Treaty, plus a 5-year interim agreement on strategic offensive arms limitation. The latter agreement allowed the Soviets to deploy more SLBM's and ICBM's than the United States (although, given its MIRV's, the United States might continue to enjoy a massive superiority in the total numbers of warheads deployed).

Therefore, Nixon was urging that Congress approve his requests for Trident and other strategic weapons, saying that the United States should not fail to act within the limitations of SALT to ensure its military strength. Senator George S. McGovern, the Democratic nominee for President, was advocating large defense cutbacks and a go-slow approach to Trident. But, for Nixon, McGovern merely provided a convenient foil.

The first test for Trident came when the Senate Armed Services Committee voted on its R & D subcommittee's recommendation to eliminate all Trident procurement funds except those for the Trident I missile. The recommendation failed of adoption by an 8-to-8 tie vote, with two senators changing their initial votes after Senator John C. Stennis of Mississippi, the influential chairman of the full committee, said aye to Trident. One of the vote-switchers was Thomas J. McIntyre of New Hampshire, the regular chairman of the R & D subcommittee who, though he had missed the Trident hearings because of illness, had left the impression that he supported the subcommittee's position.

A short time later, on the Senate floor, Senator Bentsen lost again in his effort to eliminate the Trident procurement funds. This time the vote was 47 to 39, which meant that Bentsen would have prevailed had but five more of the senators present sided with him. At least four of those critical votes are said to have been lost as the result of some unusually bold lobbying carried out by Admiral Rickover, Secretary of the Navy John W. Warner, and a White House aide. These officials held forth in the Vice President's office (which is not far from the Senate floor), inviting senators to come in for a last-minute Trident briefing. This was only part of the Trident lobbying effort. Secretary Laird and other high officials had been busy telephoning and visiting senators, and military contractors and subcontractors were being used to apply maximum leverage.

This year's round of committee hearings and floor action on Trident has not yet gotten under way. Senator Bentsen has given up his seat on the Armed Services Committee to take one on the Finance Committee. Senator

McIntyre, who will be chairing the R & D subcommittee, has let it be known that his vote last year for the Trident procurement is not to be regarded as a commitment to a continued accelerated development of Trident. Having handily won reelection last November despite criticism by the ultraconservative Manchester *Times-Union*, McIntyre will be under less pressure to conform to the wishes of the Pentagon and White House. Senator Stennis is still recuperating from bullet wounds inflicted during a holdup last winter, and the Armed Services Committee's acting chairman is Senator Stuart Symington of Missouri, who not only voted against the Trident procurement but later critcized some of his colleagues for yielding to lobbying pressures. Also, the special atmosphere that existed last year because of the SALT negotiations and presidential politics has now dissipated, and there is perhaps a greater likelihood that this year Congress will treat military programs on their merits.

Nevertheless, being one year further along the road to deployment, Trident has gained that much more momentum and is not likely to be stopped, although a stretch-out of this extraordinarily expensive program is possibile. By deciding to build the first Trident base near Bangor, Washington, the Navy has assured itself of the not inconsequential support of Washington's Senator Henry M. Jackson, who last year voted with Bentsen in committee but against him on the Senate floor.

But, all ploys by Pentagon lobbyists aside, the really critical factor with respect to Trident's fate may simply be whether members of the Senate are willing to trust themselves and hold important military programs up to the same critical standards of review applied to some of the less sacrosanct domestic programs.—LUTHER J. CARTER

Mental Health: NIMH Reeling over Proposed Budget Cuts

"All is flux," said Heraclitus, and nowhere in the federal government does this seem more true than at the National Institute of Mental Health. NIMH, which in recent years has been a more or less tripartite research-training-service organization, is now faced with a radical realignment of most of its nonresearch functions. The biggest news is the planned phase-out of support for community mental health centers, the institute's central community service activity.

The other major wrench for the institute, as is the case throughout the National Institutes of Health (NIH), is the elimination of most of its training grant and fellowship programs. The budget of the manpower and training division, which totaled $97 million in fiscal 1972, is expected to drop precipitously to $60 million by 1975.

Nervousness reigns at NIMH. No one knows what things will look like when the smoke clears. Director Bertram S. Brown has for weeks been turning down interviews with the press, and those officials who will talk prefer not to be quoted. "This is a punitive Administration," one explained. Outsiders, though, are expressing themselves. "Mental health has been dealt a staggering blow," says the American Psychiatric Association. Daniel X. Freedman of the University of Chicago has warned that the nation's capacity to educate mental health professionals may revert to the "abysmal" state it was in in 1946.

The NIMH has expanded enormously over the last decade or so, with an accompanying change of focus from the basic problems of mental illness to service programs and special work on drug and alcohol addiction. Now it appears the focus will again be turning, this time toward becoming a leadership enterprise engaged in aiding states and localities in developing their own service and training capacities.

Brown, for one, is putting the best face on things. Basically the NIMH will be moving out of its grant-giving role, he said last January, and into what he calls a "policy-wisdom-technical assistance mode."

What is happening is all part of the Administration's design to get the government out of long-term, categorical aid programs and into more experimental, time-limited projects, leaving long-term support up to the states—through federal revenue-sharing programs—and other local sources.

Because prior commitments, stretching as far ahead as 1980 in the case of the mental health centers, will be honored, the NIMH budget does not yet reflect what is happening to it. Estimated new obligations for the entire institute in fiscal 1974 amount to $645.5 million, compared to $604 million in the revised presidential budget for 1973. However, as present commitments are fulfilled, it is safe to predict that the institute's budget will be reduced significantly in future years.

Community mental health centers, authorized in 1963, have consumed an ever-larger portion of the NIMH budget since funding for them began in 1965. The program has always found greater favor in Congress than with the Nixon Administration—witness the fiscal 1973 appropriations bill passed by Congress, which allotted the centers $60 million more than requested by the President. The government has poured well over $700 million into the centers, peaking at $150 million in fiscal 1972.

Now, they are being pushed willy-nilly out of the nest. Some 400 centers are in operation, ranging from neighborhood storefront operations to slick, hospital-based clinics (see *Science*, 10 and 17 December 1971 and 4 August 1972). Although this number is well below the network of 1500 the NIMH originally envisaged for the country, the centers seem to have established a foothold in the health and social services landscape. The federal contribution is now down to about 23 percent, owing to the fact that they are funded on a declining scale over 8 years and most have been in existence for several years. Most of the remaining cost is picked up by the states, supplemented by other private and public sources and patient fees.

Nonetheless, NIMH officials are dubious about the willingness of many states to furnish adequate support unless specific requirements are built into health revenue-sharing plans, and they believe the disparity among centers will become even more pronounced. The architects of the program have long