But the function is too important for the post to be allowed to atrophy as it did once before. The right man must be found and the right emphasis given, so that the potential of the science office may perhaps be realized.

References and Notes

1. Although there is a growing body of literature dealing with foreign policy issues that have significant scientific aspects, there is very little that focuses directly on the science advisory function in the foreign policy process. My forthcoming book *Science, Technology and American Foreign Policy* (M.I.T. Press, Cambridge, in press) is an attempt to fill a gap. Other particularly relevant literature includes G. B. Kistiakowsky, *Science* **131**, 1019 (1960); R. Gilpin and C. Wright, Eds., *Scientists and National Policy-Making* (Columbia Univ. Press, New York, 1964), especially articles by H. Brooks, R. Kreidler, and W. Schilling; C. Haskins, *The Scientific Revolution and World Politics* (Harper & Row, New York, 1964).
2. J. H. Herz, *International Politics in the Atomic Age* (Columbia Univ. Press, New York, 1962), p. 19.
3. W. W. Kaufmann, *The McNamara Strategy* (Harper & Row, New York, 1964), p. 125.
4. The recently released book by H. K. Jacobson and E. Stein, *Diplomats, Scientists, and Politicians* (Univ. of Michigan Press, Ann Arbor, 1966), presents the most detailed and competent history of the test ban debate in the U.S. Government yet produced. The views on the debate expressed in this paragraph are my own, however.
5. New York *Times* **1962**, 10 (22 Feb. 1962).
6. "U.N. Resolution Against Orbiting of Nuclear Weapons," General Assembly Resolution No. 1884 (XVIII), adopted 17 Oct. 1963.
7. "Functions of Science Attaches," *SCI* [Office of International Scientific and Technological Affairs] *Directive, Department of State*, 2 Mar. 1965.
8. The present acting director, an outstanding regular foreign service officer—Mr. Herman Pollack—has considerably improved the science office's performance even though he is not a scientist and is little known outside the Department. There is a limit to the influence a regular foreign service officer can have in that position, however, for the reasons given; the gains in performance that Mr. Pollack has achieved are in part a measure of past deficiences and in part a measure of his own unusual competence.

NEWS AND COMMENT

Anti-Missile Missile: Next Entry in the Arms Race?

The anti-ballistic-missile missile (ABM), on which the United States has spent more than $2 billion in research and development funds since 1957, has for several years been waiting just off the stage of political controversy. Recently it may have been given its cue. Michigan's Governor George Romney, appearing on NBC's "Meet the Press" on 13 November as an obvious if undeclared contender for the Republican presidential nomination in 1968, dropped a hint that the ABM may have won a prominent place in Republican campaign oratory for the next 2 years.

Prior to the 1960 election, Romney recalled, the Democrats had charged that lax defense policies of the Republican administration had resulted in a dangerous "missile gap." "Now when Mr. McNamara became Secretary of Defense he dissipated that idea in about 2 months," the governor said. "But he's just confronted us with a problem of equal seriousness in indicating that Russia now has an anti-ballistic-missile system, and we don't have one. This is a development of the greatest importance. Perhaps we have a gap in this respect now, as a result of the mismanagement of the Democratic administrations, that is comparable to the missile gap that proved to be a myth."

Romney's suggestion that political capital will be made of the fact that the administration has yet to decide to produce and deploy a U.S. ABM followed a statement which McNamara made to the press after talking with President Johnson about the next defense budget. It has long been known that the Soviet Union was developing an anti-missile missile, but the U.S. intelligence community has been uncertain and divided about whether the Russians were actually deploying such a missile. McNamara told reporters there is "considerable evidence" that the Soviets are in fact deploying an ABM system.

The Secretary did not elaborate, but the evidence is reported to consist chiefly of some installations around Leningrad and Moscow and enough sign of site clearing and new construction elsewhere to suggest widespread deployment of an anti-missile system. Defense officials generally have believed that Soviet anti-missile defense technology has lagged behind that of the United States.

Romney's reaction to McNamara's disclosure is consistent with the way some members of Congress regard the administration's cautious approach to the question of deploying major new weapons systems. The House Armed Services Committee, chaired by Mendel Rivers of South Carolina, regularly excoriates McNamara for an alleged propensity to ignore the advice of his generals and admirals. In a report last May the committee suggested that McNamara's Pentagon regime is pushing the United States "toward a military position that is sterile in its imaginative content and wholly unrealistic in its application." Among other recommendations going beyond McNamara's budget proposals, the committee proposed that $168 million be appropriated for "preproduction" activities for Nike X, as the U.S. Army's ABM project is known.

Melvin R. Laird of Wisconsin, chairman of the Republican Conference of the House, and other minority members of the Defense Appropriations Subcommittee have expressed the belief that, because of present defense policies, the United States may be unable to cope with future enemy threats. These Republicans suspect the administration of being more interested in avoiding an arms race than in the "aggressive pursuit of advanced weapons development, such as the anti-ballistic missile system or the advanced manned strategic aircraft."

Laird and his Republican colleagues were, of course, all too pleased to join the Democrats on the Defense Appropriations Subcommittee in urging that Congress give McNamara the $168 million in unasked-for preproduction funds. Congress, as always, did as its committees on defense had recommended. McNamara and the President do not have to spend the extra money, but, if they don't spend it, Romney, Laird, and other Republicans are likely to make the most of the administration's decision to ignore the congressional mandate in the face of the assumed Soviet ABM deployment. The Republicans probably will make much of the Joint Chiefs of Staff's unanimous recommendation for ABM deployment, though it is believed by some in Washington that this unanimity reflects a spirit of *quid pro quo*

as each chief seeks support for his own service's proposals.

On the same day that Romney spoke of an ABM gap, the New York *Times* reported a rapid increase in Soviet intercontinental missile forces. The *Times* story, based on information obtained from "reliable sources," was taken by some people as a sign that one or more of the military services seeks to create a political climate favorable to proposals for major new weapons programs.

The *Times* reported that, in the last 2 years, the Soviet Union has been deploying 100 or more ICBM's a year, at least double the previous rate of deployment. The Russians were reported to be dispersing the missiles widely in sites "hardened" against attack. Two kinds of missiles are believed to be involved, one a small missile similar to the early U.S. Minuteman, the other a much larger missile, more like the U.S. Titan II.

According to the *Times*, some administration officials fear that a long-continued buildup of Soviet missile forces, coupled with a Soviet missile defense system, would upset the present "uneasy balance" between the two superpowers. In this view, Soviet leaders might be tempted, in a crisis, to destroy a large part of American missile forces with a surprise attack, then depend on the ABM to intercept missiles fired in retaliation. The fears ascribed to these anonymous officials are likely to keep cropping up as the debate over whether or not the U.S. should deploy an ABM continues.

Aware of the implications of the *Times* story's provocative new figures on Soviet missile strength, Defense Department spokesmen last week were at pains to emphasize the strength of U.S. strategic forces. The United States, with nearly 1000 land-based ICBM's and some 600 submarine-based Polaris missiles, maintains a 3- or 4-to-1 superiority over the Soviet Union in missiles which could be fired in a U.S.-Soviet exchange, newsmen were told. The message was that the U.S. deterrent is, and will continue to be, effective.

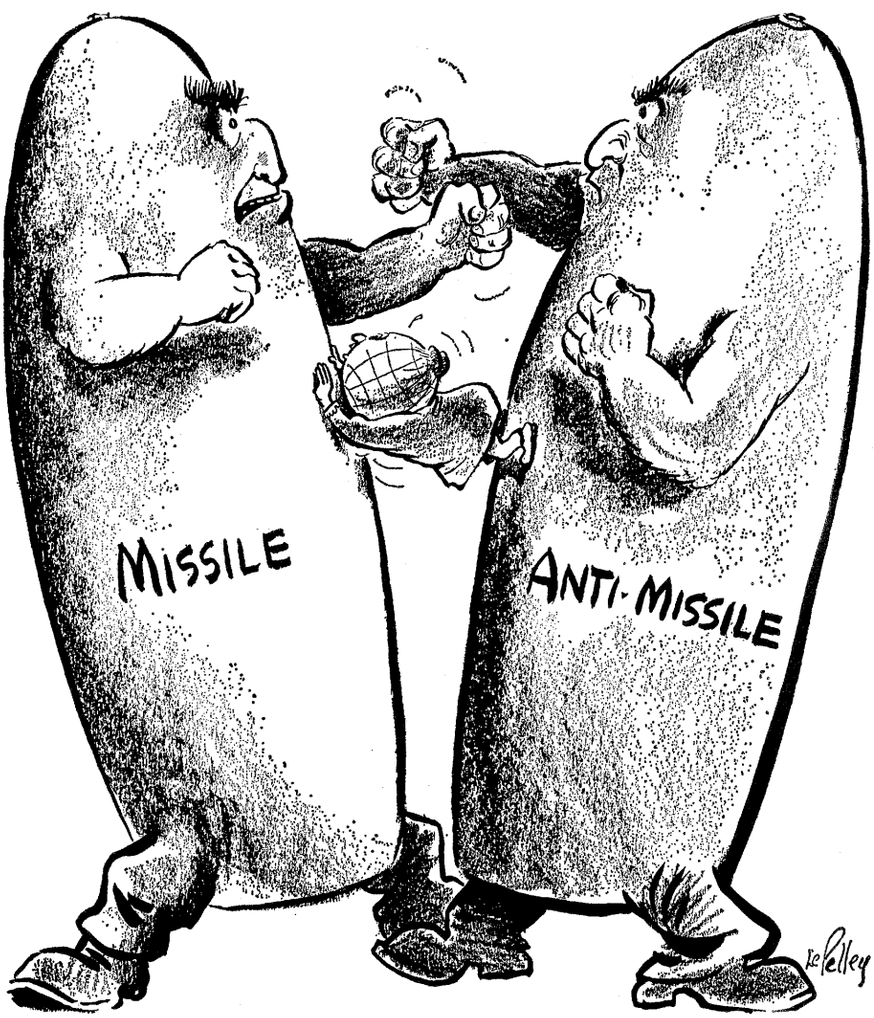
Secretary McNamara's disclosure that the administration is now assuming that the Soviets are deploying an operational ABM undoubtedly was made in the realization that, if he kept silent, before long someone in Congress would inform the news media of this intelligence assessment. McNamara told reporters that he and the President had considered possible ABM deployments, against the Soviet missile threat, and against the potential Chinese threat, which is expected to become real by the mid-1970's.

The Chinese threat, he indicated, is still remote enough that an ABM deployment against it can be deferred. Such a deployment would be designed to provide a blanket defense of the United States against a small number of relatively primitive Chinese warheads lacking effective penetration aids. In this case, a thin "area defense" system relying on the Zeus missile to intercept the warheads at long range would be employed. The cost of such a system might total about $8 billion, according to one estimate.

As for the possibility of a large-scale Soviet missile attack accompanied by swarms of decoys and radar-fooling devices, McNamara said discussion of a deployment against such a threat would continue but that nothing had been decided. In a deployment against this kind of attack, an area defense system employing Zeus would be combined with a "point defense," of various major installations and cities, with the fast-acceleration Sprint missile. Sprint would wait for warheads that escaped Zeus to reenter the atmosphere—where it is easier for radar to pick them out from decoys—before destroying them with a nuclear burst. Such a system, together with the fallout shelters and improved bomber defenses which would be needed, could cost between $15 billion and $25 billion, depending on the number of points defended and the number of ABM's deployed. If cost estimates for the ABM are no more reliable than some estimates have been for much less complicated weapons deployed in the past, the ABM's true cost could stagger the most resigned taxpayer.

Although McNamara left open the possibility that the administration might

Boys, Boys, for the sake of your dear old mother!



Reprinted by permission of the artist, Guernsey LePelley, and *The Christian Science Monitor*

decide in favor of an ABM deployment, such a commitment this year seems unlikely. The United States' immediate response to the Soviet ABM deployment, McNamara indicated, should be to continue development of the Poseidon missile. Here one has the sort of paradox found in a good deal of military thinking. Poseidon, to be fired from Polaris submarines, is viewed as additional insurance that a U.S. missile attack would confuse and overwhelm a sophisticated defense of the kind which, if deployed in this country, ABM advocates believe would protect enough American lives to justify its huge cost. The Poseidon system itself would cost several billion dollars. According to unconfirmed reports, the new missile would carry multiple warheads and various other penetration aids.

McNamara appears to have believed all along that, whereas spending money to keep U.S. nuclear retaliatory forces up to date is a good investment, spending large sums for an ABM might be a poor one. He told Congress in February that large and continuing expenditures on strategic offensive forces should be expected. "We can afford to spend more on defense if we choose to do so and if we think it adds measurably to our safety," he added. "I do not believe that development of the currently designed anti-ballistic-missile system fits that criteria."

McNamara later observed that, when claims are made that the ABM could cut fatalities from a nuclear attack by, say, one-fifth, some people reply: "We don't know what difference there would be between the United States having lost 80 million lives versus one having lost 100 million lives." "It is not an unreasonable argument," the Secretary said.

In debating the pros and cons of the ABM one can argue, endlessly and inconclusively, about the effect of its deployment on an adversary's decisions as to the size and makeup of his offensive and defensive forces and on his behavior in a crisis (*Science,* 24 December 1965). The arguments usually rest on easily challenged assumptions. From the standpoint of arms control, however, so long as there was substantial doubt that the Soviets were deploying an ABM, it was easy to argue that a U.S. deployment would be destabilizing and a bad example for the Russians. This argument was central to a proposal made last year, by a White House Conference panel, for a 3-year moratorium on ABM deployment.

There is reason to think that the panel's chairman, Jerome B. Wiesner, provost of M.I.T., still believes that the U.S. should defer its decision on deployment. As another member of the panel observed, the scope and magnitude of the Soviet deployment are not yet really known. "A deeper question," he said, "is to look at what our own strategic buildup was meant to achieve, and ask whether a Soviet ABM reduces its deterrent effect. I've never believed in a magic ratio for deterrence."

Generally, few opinions about the wisdom of U.S. deployment of an ABM seem to have been changed by the assumed Soviet decision to deploy such a system. Those who have favored deployment have been reinforced in their opinion. Those who have not favored deployment still think it would be unwise. Two members of the Federation of American Scientists' executive committee told *Science* they would be surprised if FAS's position changed from its last-stated position. The federation predicted last May that deployment of Nike X would lead to a spiral of military expenditures by both the United States and the Soviet Union while increasing the security of neither.

"It would be unfortunate indeed if either country were panicked into decisions of this type by equivocal evidence of the other's progress or intentions," FAS said. "And while the hope of encouraging Soviet restraint is an additional important argument against U.S. missile defenses, we do not believe that our nation need engage in a puerile contest of matching the wasteful blunders of others."

The Council for a Livable World, the group created a few years ago by the late Leo Szilard, has shared FAS's views on the ABM. The past chairman of FAS, W. A. Higinbotham of Brookhaven National Laboratory, says, however, that if the Russian ABM deployment should be extensive, the federation's position might change.

If the Johnson administration should continue much longer to defer a decision on ABM deployment, this could bring on an interesting test of the political power of the so-called "military industrial complex" which President Eisenhower, in his farewell speech, warned about. Some 3000 companies are participating as contractors, subcontractors, and vendors in the development of Nike X. Western Electric holds the prime contract, while General Electric, Raytheon, Bell Telephone, Sylvania, Sperry Rand, Thiokol Chemical, Hercules Powder, Douglas Aircraft, and Martin-Orlando are doing the major subcontract work. Research and development spending for Nike X has been totaling about a half billion dollars a year.

Nike X development activities are felt in all American states except Alaska, the Dakotas, Wyoming, and Montana. Only 15,000 industry employees have been working full-time on Nike X, but if an ABM system should be ordered into production for deployment that figure would soar.

Some arms control specialists believe that industry would see an ABM deployment as a godsend. They observe that prospects for a major post-Apollo civilian space program are uncertain, that the overseas military assistance program (except for Vietnam) is declining, and that large "offshore" military purchases by Germany and other U.S. allies from American companies cannot be counted on. Furthermore, military pressure on Western Europe by the Soviet Union has been subsiding, thus lessening interest in strengthening allied forces there.

On the other hand, there are important offsetting circumstances. The Vietnam war has led to the highest defense spending since the Korean conflict. And China poses a threat in Asia even though it will be many years before China possesses the sophisticated military technology of a superpower.

In the past the military-industrial complex has had the look of a paper tiger. Secretary McNamara has phased out or canceled several major weapons programs (the Skybolt missile and B-70 bomber programs, for example) with only the mildest political repercussions.

Given the available evidence, one must question whether there really is a complex of military and industrial interests capable, without a national emergency, of generating strong political pressures in more or less concerted fashion. However, if the "complex" does spring to life as a potent political force, it will find willing allies, in Congress and among Republican presidential aspirants such as George Romney, to help press for deployment of the most expensive weapon system in history.—LUTHER J. CARTER