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to provide information and to stimulate discussion. Not to be attributed as official FAS policy unless specifically so indicated.

FAS OPPOSES BIOLOGICAL & CHEMICAL WARFARE

(This statement was first released at a press conference, on June 19, at Massachusetts Institute of Technology, by Prof. Alexander Rich.)

In view of the potential danger to our entire civilization from the development of biological and chemical weapons and in view of the specific disadvantages to the security of the United States from further development of these weapons, the Federation of American Scientists urges:

- 1. That the President declare a policy of "no first use" of chemical and biological weapons;
- 2. That all mass production of biological weapons be abandoned;
- 3. That development of new biological and chemical weapons be stopped.

In addition to the aforementioned unilateral measures, we urge the U.S. Government to seek an international agreement to prohibit the use of biological and chemical weapons and to renounce development of such weapons.

There is ample evidence that the United States Government is engaged in a large-scale effort to develop and produce lethal biological and chemical weapons. There are already stockpiles of biological and chemical munitions of all kinds available to our military forces—rocket warheads, conventional artillery shells, liquids to be sprayed directly from planes—and considerable effort is being devoted to development of more effective disease-producing organisms and chemicals, and more effective methods of distribution.

We believe that the introduction of such weapons, and particularly of biological weapons, is highly undesirable. In the case of the biological agents, it appears likely that the principal targets would be civilian populations rather than military personnel. We find this morally repugnant. Second, the continued development and stockpiling of these weapons would complicate further the problems of arms control and inspection, and would represent a major step backward in our attempts to reduce the chances of world war. Finally, even if one construes the interests of the United States in the narrowest possible sense, it is clear that the development of these weapons is undesirable. Biological weapons are potentially very cheap, and their dissemination, particularly among the non-nuclear nations, would have the effect of providing these nations for the first time with a striking power comparable to that afforded by nuclear weapons. Research, development and the preparation of such weapons can be accomplished in ordinary microbiological and chemical laboratories. Thus, most nations, small and large, could easily and secretly acquire a significant biological and chemical warfare capability, which, furthermore, would be much less susceptible to inspection and control than are nuclear weapons. Large scale efforts in our own country are certain to stimulate similar efforts in other countries. The result would be to increase the likelihood of accidental war and to reduce the effectiveness of our own nuclear "balance of power."

RISKS OF PRESENT POLICY

It is not clear what advantage the U.S. can gain in return by the acquisition of biological weapons. It has been suggested by the advocates of these weapons that they offer a choice of response to attack intermediate between the conventional and the nuclear, but it appears that when fully developed they would be as destructive to human life as nuclear armaments and it is unlikely that any nuclear power so attacked would hesitate to reply with nuclear weapons. It has been argued that the possession of biological and chemical weapons by the Soviet Union makes it essential that we develop similar weapons for purposes of "retaliation", but it is clear that nothing further need be added to our own nuclear deterrent to discourage an attack by the Soviet Union

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FAS URGES THREE POLICY PLANKS

The FAS is submitting three major policy proposals to the platform committees of the Republican and Democratic Conventions.

The propositions are:

- 1. That the United States cease its advocacy of a multilateral NATO nuclear force (MLF);
- 2. That the President declare a policy of "no first use" of chemical and biological weapons, and that all mass production of biological weapons be abandoned;
- 3. That no hasty decision by the United States be made to install a ballistic missile defense system even in response to Soviet deployment of such a system.

These policies, previously approved by the FAS Council, were presented to the Republican platform committee on July 7 by FAS Council member Owen Chamberlain. The FAS argued "that these policy recommendations are scientifically and strategically sound and that each, if adopted by our government, would increase the stability of international affairs, advance the national self-interest of the United States, and assist in maintaining a peaceful world." Full texts of the statements appear in this Newsletter.

STATEMENT ON MULTILATERAL FORCE

The proposed multilateral force (MLF) would consist of a fleet of surface vessels armed with Polaris missiles carrying thermonuclear warheads and manned by mixed NATO crews.

These weapons are intended to add to the strategic nuclear defense of Europe by giving European members of NATO a voice in the deployment and use of nuclear weapons but, at the same time, retaining an American, as well as European, veto over any decision to use them.

It is generally acknowledged that the force, as it is now conceived, would add little to the effectiveness of the present nuclear deterrent. Furthermore, plans for the MLF are having a divisive effect on the NATO alliance. France is hostile to its establishment; and the other members of the alliance, with the exception of West Germany, are at best lukewarm towards the project.

The main arguments advanced in favor of the MLF are that, by allowing our German allies a finger on the nuclear trigger, it will assuage and forestall pressures in West Germany for independent development of German nuclear weapons. Thus, according to its proponents, the MLF is aimed primarily at preventing further proliferation of nuclear weapons.

However, German leaders have already announced that they regard the present MLF concept as only the first step towards a system in which the American veto will be removed.

Furthermore, since the MLF was conceived, there has been considerable progress in the negotiations at Geneva aimed at effective arms control agreements. Thus, we and the Russians concur on the main provisions of a treaty for the prevention of dissemination of nuclear weapons, weapons materials and weapons technology; our insistence on the MLF is now a major obstacle to such an agreement.

This insistence on the MLF seems also to be one of the most serious obstacles in the way of our Government's proposal for an inspected freeze on the further production and deployment of nuclear missile systems, as well as to other proposals aimed at reducing tensions and the dangers of war in Europe.

Thus, of the number of prospects which now seem to be attainable, all aimed at the inhibition of further proliferation of nuclear weapons, the MLF seems at the same time the least effective, and the greatest impediment to further progress.

Fortunately, plans are not very far advanced, and it would still appear to be possible to drop this project without damage to NATO.

MULTILATERAL FORCE: DEBATE CONTINUES

As the North Atlantic Treaty Organization enters its sixteenth year with its future apparently becoming more and more shaky, the United States' proposal for a NATO multi-lateral nuclear force looms as a potential solution to the sticky NATO problem. From one point of view the MLF may appear as a dangerous new step in arms proliferation; a more hopeful interpretation is that the MLF might provide the basis for a new Atlantic community, in place of the one which NATO has failed to produce.

The concept of an MLF was first suggested in 1960 by then Secretary of State Herter with the approval of President Eisenhower. It has since been reaffirmed by both President Kennedy and President Johnson. Essentially, the MLF would be a fleet of surface warships, equipped with strategic nuclear weapons and owned, controlled and manned jointly by mixed forces from various NATO participants. Firing of the weapons in wartime would be by decision of an agreed number of participants, including the United States.

A working group representing the U. S., Italy, Germany, the U.K., Belgium, Holland, Greece and Turkey has been meeting in Paris since October, 1963, with the purpose of reaching a general understanding of what the MLF would involve and its political and technical feasibility. Early in June, Thomas K. Finletter said in Paris that he believed agreement would be reached by the end of the year on the composition and cost of the MLF. Mr. Finletter is the U. S. representative at the Paris headquarters of NATO. (NY Times, 6/9).

U.S. AIMS FOR MLF

According to Gerard C. Smith, Special Adviser to the Secretary of State for the MLF negotiations, the problem to which the MLF project is addressed is the following: "How can the United States share strategic deterrent responsibilities with its NATO allies without promoting independent national nuclear forces?" Quite obviously the problem has been pointed up by the decision of France to develop its own nuclear force. According to Mr. Smith, the MLF would provide an answer to the growing concern of European nations that they have a larger role in long-range strategic deterrence. The MLF would furthermore actually contribute to arms control through its braking action on national proliferation of nuclear weapons. Finally, the MLF could "contribute to European integration" through its de-emphasis of national nuclear programs, through its effect in narrowing the present gap between nuclear and nonnuclear powers in Europe, and through its creation of a common venture in which European countries can work together. (Dept. of State Bulletin, 5/18/64).

FEAR OF WEAPONS SPREAD

The argument that the MLF will be effective in preventing national nuclear development has recently been rebutted by John Silard in a Study Paper on the MLF, written for the Council for a Liveable World. (4/64). According to him, in the short run, i.e., for the 1960's, "MLF proponents vastly over-estimate European desire for a larger nuclear role." Mr. Silard continues, "If we espouse the view that our allies' self-respect requires parity of nuclear participation with us, it will not be long before they espouse the same view. By contrast, without our active salesmanship, nuclear arms development may remain unpopular in Germany, England, and other nations." On the other hand, he argues that the MLF is inadequate for the long-term aspirations of the NATO nations. This is because in the long run, there may well be alterations in the present community of interest between the U. S. and its NATO allies as a result of our closer ties with Russia, their fear of a resurgent Germany and increasing economic conflicts between the U. S. and Europe. With such changes, the European countries might become increasingly dissatisfied with a MLF subject to U.S. veto power, and these countries may ultimately proceed with development of their own nuclear forces, with the boost which the U. S. will have provided through the MLF.

On the subject of the MLF as a unifying force in Europe, Mr. Silard feels rather that the outcome will be less, rather than more, unity. "Our European allies are not requesting the MLF but are having it forced upon them by our insistence. With the exception of some element in Germany, the MLF is not welcomed among the other nations, who must join it from fear of German predominance . . . And it is also causing serious internal political friction in NATO countries since

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PENTAGON HUNTS LOST SUB AND SATELLITE

The U.S. government is tiptoeing gingerly around the implications of two embarrassing nuclear mishaps.

The older and better publicized case is the nuclear submarine Thresher, which disappeared 220 miles east of Boston in April 1963. An extensive underwater search at that time failed to locate the wreck, though the bathyscaph Trieste did recover one piece of tubing identified as coming from the Thresher. Now the Trieste, remodeled to increase its underwater range, is returning to the search, despite strong objections from some quarters in the Navy, who are concerned over renewed publicity and possible effects on morale in the submarine force. (NY Times, 6/9).

The argument that finally prevailed was that the Navy's inability to locate submarines lost at great depth could be diplomatically as well as technically embarrassing in an age of nuclear-powered submarines armed with missiles carrying hydrogen bombs. Such an accident close to a foreign country could seriously handicap U.S. efforts to gain admittance for these vessels to foreign waters and ports. U.S. failure to retrieve a lost vessel might also open the possibility that some other party, governmental or private, would attempt to find and salvage such a submarine (and missiles and warheads).

MISPLACED PLUTONIUM

The other accident, which has even more unpleasant possibilities, happened in the launching of a Transit navigational satellite from Vandenberg Air Force Base last April. The satellite failed to go into orbit and was lost, including its SNAP-9A nuclear battery fueled by a kilogram of highly radio-active (10,000 curies) and toxic plutonium 238. Because the tracking radar lost contact with the rocket over the Pacific, the Defense Department does not know where the plutonium came down, or in what state of dispersion.

The official presumption is that the payload burned up on re-entering the atmosphere over the Indian Ocean, and that the plutonium was dispersed in minute particles at an altitude of around 120,000 feet. However, the New York Times story goes on to say, "the presumption is supported by indirect engineering calculations, but there is no direct evidence on what happened to the payload." The other possibility is that fragments of the metal survived the trip back to earth; they would pose a severe hazard to anyone coming in contact with them. The "maximum permissible burden" of plutonium 238 for radiation workers is two billionths of a gram. (NY Times, 5/24).

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FAS STATEMENT ON BALLISTIC MISSILE DEFENSE

The FAS is strongly opposed to the installation of a ballistic missile defense system by the United States.

The term ballistic missile defense means defense against incoming missiles (incoming ICBM's). The most commonly conceived form of defense is the anti-missile missile, by which incoming missiles might be shot down or rendered harmless by ground-based missiles armed with small nuclear warheads.

It has long been recognized that defense against ICBM's is at best a very difficult matter because of the great speed with which these missiles approach. The difficulty is compounded by the fact that very high reliability would be required by a defense system against such destructive weapons as ICBM's. During World War II a defense system with rather small efficiency could be considered quite effective. The Battle of Britain was stopped when the British were able to knock down just 5 percent of the attacking German

BIOLOGICAL & CHEMICAL WARFARE — Continued

upon us, just as their nuclear deterrent discourages our own use of such weapons. It has been said that nuclear weapons cannot deter attack by biological weapons, because the latter lend themselves to surreptitious use, so that it would be impossible to identify the assailant against whom to retaliate with nuclear weapons. It is not clear, however, what advantage would arise in that case from the possession of a biological retaliatory capacity, since the assailant would be equally unknown.

Chemical warfare, though largely tactical in nature, also appears to us undesirable. Chemical weapons, like biological and nuclear weapons, are widely thought of as "terror" weapons, and their use introduces dangers of escalation far out of proportion to their effectiveness.

Biological agents seem particularly well suited for attacks against civilian populations rather than military targets. Since biological agents must be either inhaled or swallowed, it is relatively easy to protect disciplined troops, while civilian masses are peculiarly vulnerable, not only because of their relative lack of discipline and protective equipment, but because of the greater effectiveness of biological agents in areas of high population density. Biological weapons directed against man are potentially as dangerous to our civilization as are nuclear weapons. Though some mention has been made of the development of so-called "humane" weapons resulting in incapacitation rather than death, the published information on biological warfare suggests that considerable effort is being devoted to development of lethal agents such as those causing anthrax and pneumonic plague. Even in the case of diseases not normally fatal, the lack of information concerning the effects of massive doses of virulent organisms or of a high density of infected persons makes effect unpredictable.

The argument is made that development of biological weapons should be continued for defensive purposes. Defense against such weapons consists either of preventing entry of the infectious agent into the body or counteracting the effect after entry. In the former case the methods of protection are likely to be fairly independent of the weapon material; in the latter case, each agent would require its own specific countermeasures. As the variety of usable organisms is potentially unlimited, development of new weapons by us can give no assurance of our ability to defend ourselves against attack with other organisms. It would, therefore, appear that the only avenues of research for defense that have some likelihood of being fruitful would be concerned either with prevention of entry or with very general antimicrobial substances. Such a program need not be pursued in secret, nor need it involve the development of new biological or chemical weapons.

Finally, we are concerned with reports of the field use of chemical weapons in Viet Nam. Allegations relating to the use of anti-crop agents under American supervision have been officially denied. However, reports that defoliating agents have been used to destroy protective cover have been confirmed by representatives of the Department of Defense. These charges give rise to the broader implication that the U.S. is using the Vietnamese battlefield as a proving ground for chemical and biological warfare. As has already been stated, FAS is opposed to the "first-use" of chemical and biological weapons. We are further opposed to experimentation on foreign soil and also feel that such experimentation involving citizens of other countries compounds the moral liability of such actions.

bombers. Today a defense system against ICBM's that was only 5 percent efficient would be almost worthless.

It is the view of the FAS that there is today no known way to construct a satisfactory defense against ICBM's. Indeed, in the foreseeable future there is not going to be any satisfactory defense. This does not mean that single nuclear missiles cannot be knocked down or rendered harmless by anti-missile missiles, or that several nuclear missiles cannot be knocked out. Rather, it means that any foreseeable defense system can be annulled by means that are technically feasible and economically practicable.

The annulment of a missile defense system would be accomplished in part by the use of so-called penetration aids—measures to allow defenses to be penetrated, such as the use of decoys accompanying missiles. Further, missile defenses could be rendered ineffective by increases in the numbers of offensive weapons against which the defenses would be required to protect. A defense system can always be evaded by the procedure known as saturation—the use of a greater number of offensive weapons than the defense system is capable of handling. It is the firm belief of FAS that these factors render any missile defense unfeasible at present and for the foreseeable future.

IMPACT ON U.S. SOCIETY

Apart from the fact that it would be an enormous waste of effort and money for the United States to install a missile defense system, it would also have many objectionable effects upon the United States society. Instead of improving our security, it would cause our adversaries to build up their offensive armaments to a new level much higher than that now existing. Far from improving United States security, this would increase the destructiveness of the war which we all hope will never come but remains a possibility.

As has been pointed out by Secretary of Defense McNamara, a missile defense system would bring with it a civil defense system. We of the FAS believe that it would be a civil defense system more massive than any that has been put before the Congress up to the present time. It would require much more than fallout shelters. Such a program would require a broad system of blast shelters, at huge expense. Furthermore, our civilian population would have to be trained, to some extent regimented, and taught unquestioning obedience to authority. This would mean a hardening of our society, a striking change in our American attitudes, and a weakening of our democratic institutions.

The FAS stands opposed to the installation in the United States of missile defenses, whether or not such defenses are seriously attempted by the Soviet Union. Because the Soviets have a long-standing tradition of dependence on defense, they may be led to reliance on missile defense. There are reports that the Soviet Union is installing some missile defenses. Whether or not these reports are true, it does not follow that it would be in the best interest of the United States to deploy missile defenses. United States reaction should be based on a careful analysis of its own situation. The FAS concludes that, regardless of Soviet action, the U. S. should not, under present circumstances, install missile defenses.

The FAS reaches the conclusion that deployment of a missile defense system in the United States would be extremely costly, that it would be militarily unreliable because it would be effectively countered by a large build-up of Soviet ICBM's aimed at the United States, that it would have undesirable effects in hardening United States society, and that it would lead to a new increase in international tension.

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The FAS, founded in 1946, is a national organization of scientists and engineers concerned with the impact of science on national and world affairs.

DEBATE ON MLF — Continued

it requires them to cast their lot unequivocally either with the United States or de Gaulle." It should be noted, however, that at least one European group has indicated its approval of the MLF. The Action Committee for the United States of Europe, an influential body of Europeans headed by Jean Monnet, has given qualified support to the idea. The committee said the MLF would serve the cause of a united Europe and Atlantic partnership, provided that it envisioned the eventual formation of a European nuclear force. (NY Times 6/3).

Finally, the contrast between the MLF idea and President Johnson's proposals at Geneva for nuclear freeze and non-proliferation agreements indicates an apparent inconsistency in our policy, State Department arguments to the contrary. Mr. Silard finds that the MLF "is today the single proposal for a new advance which stands in the way of a leveling off of the nuclear arms race."

NATO'S OTHER TROUBLES

Whether or not the MLF is the answer to NATO's problems, there remains the fact that the alliance is in trouble. The problem, according to a N. Y. Times editorial, is that "the danger that brought NATO into being has now receded." Instead, the Alliance needs to adapt to the changes which have occurred in the power and economic structures during the last fifteen years. Thus, the increasing prosperity of Europe could mean a larger European role in the West's global policies. Further, changes in the nature of war since World War II have led Europeans to wonder about U. S. willingness to risk nuclear war to defend Europe, and these doubts have led in turn to increasing European desire for participation in the management of the West's nuclear deterrent. Here, according to the N. Y. Times, the argument could lead to the MLF but "the United States will have to go much farther."

Apparently, at the NATO Council meeting held in May at The Hague, no one seemed to be going anywhere. One explanation for the lack of positive proposals is that the United States was reluctant to make them for fear that France would shoot them down. The strategy, according to that observer, was to try to get the French to make the suggestions, a technique given little chance of success. (W. Post, 5/13). Difficulties with France are illustrated by one problem that NATO is facing: the lack of trained infantry, essential for handling brush-fire wars. With a strong possibility that British troops may have to be withdrawn from the left flank of the NATO position of West Germany, the failure so far of French troops to take up positions on the right

flank must, if continued, force a reassessment of the value deriving from this NATO strategy. (NY Times, 6/3).

A recent article by Henry A. Kissinger, professor of government at Harvard University, has proposed a possible solution to the growing rift within NATO. Professor Kissinger suggests that NATO appoint a high-level political body to coordinate the policies of its members and thus avert public displays of disunity. Professor Kissinger concludes that, as now constituted, the alliance does not fit the needs of the nuclear age. However, formation of a high-level political body with the U.S., Britain, France, West Germany and Italy as members, might heal the growing rift between Paris and Washington. He notes that in 1958 President de Gaulle proposed that a directorate of France, Britain and the U. S. be formed. The addition of West Germany and Italy should not make such a body unpalatable to de Gaulle. According to the professor's proposal, the political body "should discuss how to implement common Atlantic purposes and define the scope of autonomous action where interests diverge . . . It should also be charged with developing a common strategic doctrine." In the absence of a common foreign policy of NATO members, or at least an agreed range of divergence, "the attempt to devise a common strategy is likely to prove futile." (NY Times, 6/21).

AIR POLLUTION

Medical reports presented at the recently held conference of experts on air pollution at Strasbourg, France, focused on the correlation of air pollution with the occurrence of such diseases as cancer, chronic lung disease, and even anemia and stunted growth.

English experts noted the success of their one hundred year old program to curtail industrial air pollutants as well as the recent extension to control heating materials used in private homes.

In the United States, California is the only state actively engaged in trying to control motor vehicle exhaust by legislation requiring use of exhaust fume purifiers, afterburners or engine modifications on all cars as of 1966. The California report estimated the cost at \$500 million per year.

Concurrent with the Strasbourg meeting, Senator Muskie (D-Maine) was holding hearings on the domestic auto industry's plans to control auto exhaust. The industry spokesmen felt it advisable not to extend the California requirements to the entire country until the various devices were perfected. Afterburners or exhaust purifiers were expected to cost the auto manufacturer \$20-\$25 and the car owner approximately 1/5 cent per mile. Proposed modifications of the ignition and carburetion systems would also cost about \$20, but would more than pay for themselves in increased gasoline economy. Senator Muskie was "disturbed" at the industry's reluctance to make the modifications available to the other forty-nine states.

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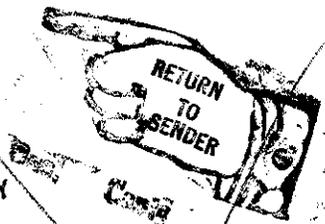
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