

# F. A. S. NEWSLETTER

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

## DESALTING PROGRAM GETS A BOOST

Although the potential application of nuclear power for the desalination of sea water has been officially recognized for almost ten years, this project has not begun to look practicable until relatively recently; now, moreover, renewed interest in the subject by the Administration points to the development of a crash program. Thus, last July, President Johnson called for a step-up in the project by directing Mr. Kermit Gordon, Director of the Bureau of the Budget, to ask the Department of the Interior "to take immediate action to develop a plan for an aggressive and imaginative program to advance progress in large-scale desalting of sea water." The action was to be taken in collaboration with the AEC and in consultation with the Office of Science and Technology. The Department of the Interior was asked to report back to the Bureau by September 11 with "an optimum strategy and time schedule for relating the development of large-scale nuclear power technology to the development of large-scale desalting technology."

### NEW INTERIOR-AEC REPORT

The report of the Secretary of the Interior and the Chairman of the AEC was released by the White House in October. In summary, Interior recommended: (1) that the Anderson-Aspinall Act of 1961, the nation's legislative base for the desalting effort, be extended through 1972, the monetary authority increased and the Department's authority to build experimental facilities clarified; (2) that there be established a West coast test facility for testing of modules and full-size components of distillation plants under sea water conditions; (3) that construction be started on at least one intermediate-size prototype plant in 1967; (4) that an immediate and comprehensive study of all phases of comparative water needs be undertaken; (5) that the basic research effort be increased to discover entirely new desalting techniques, to develop the reverse-osmosis process and to perfect the distillation process.

The report of the AEC recommended: (1) that its reactor development program be supplemented to provide economic nuclear energy sources for anticipated intermediate and large-scale desalting needs; (2) that development of the heavy-water moderated, organic-cooled reactor concept be pursued for the present as the reference reactor system to support the large-scale desalting program as well as single-purpose electric-power applications; (3) that other promising reactor concepts be assessed as sources for the near-term, intermediate desalting needs; (4) that engineering analyses be pursued to explore the coupling of nuclear power plants to desalting facilities.

Finally, a detailed joint working program will serve as the general framework for cooperation between the two agencies. This program outlines plans for the engineering development of the coupling between nuclear steam sources and desalting facilities; the development and timing of prototypes so as to demonstrate operation of a fully coupled prototype of a large-scale nuclear desalting plant in the mid-1970's; and the role of industry and Government laboratories, including the Oak Ridge National Laboratory. Mr. Kenneth Holum, Assistant Secretary for Water and Power, and Commissioner

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## FAS STAND ON NUCLEAR WEAPONS CONTROL

In view of the comments made during the recent campaign by both major political parties concerning the control and use of nuclear weapons, the FAS Executive Committee has adopted the following statement:

The FAS is unequivocally opposed to the diffusion of control of nuclear weapons, and believes that all decisions regarding use of these weapons should remain in the hands of the President. However, we believe that the argument about who should control nuclear weapons obscures more basic questions concerning the conditions in which they should be used. The FAS feels that it is now appropriate to reissue its statement of February, 1961 dealing with the use of nuclear weapons.

*(Editor's Note: The statement reprinted below was adopted by the FAS Council in February 1961, and originally appeared in the Newsletter of March 1961.)*

### NO FIRST USE OF NUCLEAR WEAPONS

#### Resolution

"We urge the government to decide and publicly declare as its permanent policy that the U.S. shall not use nuclear weapons of any kind under any circumstances except in response to the use of nuclear weapons by others. We urge that the strategic plans and the military deployments of the U.S. and its allies be brought as rapidly as possible into a condition consistent with the over-all policy of not using nuclear weapons first."

#### Explanatory Statement

In adopting this resolution, we are not under the illusion that we are expressing the unanimous opinion of scientists. Still less do we imagine that our government could implement the resolution without prolonged private study and intense public debate. We present the resolution now as the considered view of a group of people who have examined the problems of defense and disarmament and have come gradually to certain basic points of agreement. We differ sharply among ourselves concerning many questions. Some of us place primary emphasis on immediate steps toward disarmament, while others believe our best hope of peace lies in negotiating from "positions of strength." But we have all, from our several points of view, arrived at the conclusion that continued reliance on nuclear weapons for defense against non-nuclear attack is unwise and dangerous.

We are aware that weighty arguments can and will be brought against our position. Present United States policy is to deploy troops and ships armed with tactical nuclear weapons, without any publicly announced doctrine to govern the use of these weapons. The intent has been to deter military aggression, even of a non-nuclear type, by the implied threat of nuclear retaliation. Some will justify this policy by claiming that it has preserved the peace, and that FAS is advocating moving from a situation of proved short-term stability into a new region of precarious equilibrium and unknown risk. It may be that our present policy has been an important factor in maintaining a precarious status quo. However, we believe that our principal deterrent (in Europe

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and elsewhere) has been our willingness to intervene and take whatever action might be necessary. The United States surely has the basic capability to do so without resort to nuclear weapons.

Our arguments against the present policy cannot be brief or simple. Basically, we believe that our nuclear shield, in Europe, Formosa, and elsewhere, is or will shortly become ineffective, and that our nuclear deterrence of non-nuclear war will become illusory. The threats most likely to occur in the years ahead are the kind for which nuclear counter-measures would be disastrously inappropriate and could not be used without serious risk of involvement in nuclear war; few military planners still believe it possible to keep a limited nuclear war from escalating into a general conflict. This realization, coupled with serious doubts of the military advantages to the United States of attempting to conduct such a war, has led to a growing belief that the United States would not, in fact, use nuclear weapons to defend Europe against a non-nuclear attack, and that the United States would discourage its allies from using such weapons.

On the other hand, a strongly-stated policy of determination to resist small-scale aggression against neutral and allied countries by appropriate non-nuclear forces would be a far stronger shield. We shall be better off, purely from a military point of view, if we officially abandon the crumbling shield of nuclear deterrence and reestablish our non-nuclear forces as our first line of defense. To continue to behave as if a nuclear shield and deterrent were adequate is dangerous. Only if we have the courage to abandon such a policy are we likely to have the will to substitute an effective non-nuclear shield in its place. This is the meaning of the second sentence in the FAS resolution.

In the minds of most of us, the military arguments in favor of our resolutions are already strong. But the political arguments are equally compelling. There are three quite distinct, but mutually reinforcing, political arguments.

First, a declared "no first use" policy by the United States would ease considerably the pressures within non-nuclear nations to attain an independent nuclear capacity. At the same time, the present nuclear powers would feel less need to equip their allies either with nuclear weapons or with the know-how and materiel to produce them. We recognize that such a declaration would not have equal impact on all non-nuclear countries and, in particular, that such a declaration would not be expected to prevent China's emergence as a nuclear nation. Nevertheless, to the extent that the dispersion of nuclear weapons is retarded, so too are the dangers of accidental and catalytic nuclear wars reduced.

Second, a declared "no first use" policy by the United States, coupled with unequivocal evidence of United States determination to formulate realistic disarmament proposals, will enhance the possibility of achieving agreements on disarmament. The reorientation of our forces and the de-emphasis of nuclear weapons envisioned by this statement will

ease the tensions which surround the world's trouble spots. In such an improved international atmosphere it should be possible to negotiate the disarmament agreements which alone are capable of providing long-term security.

Lastly, although most people feel some assurance that the United States would not initiate an all-out nuclear war, there is no similar assurance with respect to United States use of "small" nuclear weapons in response to aggressions which may occur in, e.g., Berlin, Laos, or Formosa. The acknowledged willingness of the United States to initiate the use of nuclear weapons in certain circumstances creates much of the distrust and resentment felt by others toward us. Rejection by the United States of any first use of nuclear weapons would increase the respect, and decrease the suspicion, which a large part of the world, including many of our allies, feels toward us.

FAS believes that renunciation of first use of nuclear weapons by the West, coupled with appropriate adjustments in military policy and seriously conceived disarmament proposals, would enhance the effectiveness of our deterrent and increase the likelihood of some major disarmament agreement. At least, this is an urgent and unequivocal first step along the road to "general, complete and controlled disarmament." Pending an international convention providing for the controlled reduction of nuclear arms, unilateral declarations by the major nuclear powers will be a useful stop-gap. We emphasize that the unprecedented situation of an expanding nuclear arms race calls for new thinking and careful consideration of unprecedented policy decisions.

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James T. Ramey were designated to coordinate matters between Interior and the AEC.

### EARLIER REPORT OPTIMISTIC

Earlier this year, an inter-agency task force had reported to the Office of Science and Technology on the feasibility of using nuclear power for conversion of sea water to fresh water. The task force concluded after a year's study that a huge nuclear plant producing vast quantities of cheap electricity and low-cost water could be built by 1975. Such a plant would generate so much heat that just the waste heat could be used to warm a stretch of ocean 40 square miles in area. The task force concluded, as had researchers in the Department of the Interior, that the desalting of water becomes economically feasible only if it is done on an extremely large scale. The plant which the task force believed could be built by the mid-seventies would provide 620 million gallons of water a day and would produce 1.4 million kilowatts of power a day. It would be one of the largest power plants in the world, meeting the power needs of 1½ to 2 million people as well as the water needs of 3 million people. In contrast, Commissioner Ramey, in a speech prepared for delivery at the Third Geneva Conference, described the current state of the desalting and nuclear power technologies as follows: "(a) Desalting plants of about 1½ million gallons per day are operating successfully in the United States, and up to 50 million gallons per day are considered feasible with some risks. Development work is needed to get to 50 million gallons per day and 150 million gallons per day single unit plants. (b) Nuclear reactors producing 500 to 600 megawatts electrical (1,500 thermal megawatts) are being constructed on a commercial basis and are capable of being coupled to desalting plants. For sizes over 2,000 and 3,000 megawatts thermal, further development is necessary in some cases."

### CALIFORNIA STUDY

Joint efforts between public water supply bodies and the Federal Government seem a likely possibility in the future development of the desalting program. One such undertaking began this summer when the Metropolitan Water District of Southern California signed an agreement with the AEC and the Interior Department to carry out a jointly financed engineering study of a large demonstration nuclear powered desalting unit. The plant to be considered would have an output of 50-150 million gallons of fresh water a day and an electrical capacity of 150-750 megawatts. The study will include preliminary plant design, recommendation of a plant site, a comparison of nuclear power costs with the costs of fossil fuels, an evaluation of reactor systems, detailed construction cost estimates, proposals for disposing of electricity and detailed water and electricity production cost estimates.

### JOINT EFFORTS WITH OTHER COUNTRIES

The President's directive to the Department of the Interior and the AEC, via the Bureau of the Budget, stressed the important benefits which significant advances in desalting technology would yield throughout the world. The agencies were directed that, in developing their plan, "full recognition should be given to the importance attached by the President to sharing the benefits of American desalting technology with other nations." So far, several joint projects between the United States and other nations already exist. One such

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## ALTERNATIVE PROPOSED TO REPLACE MULTILATERAL FORCE

*(The following letter appeared in the New York Times on Nov. 17. Prof. Jay Orear, of the Dept. of Physics, Cornell University, is a member of the FAS Council. He is presently at CERN, the European Organization for Nuclear Research, in Geneva.)*

Much of the recent discussion on a NATO multilateral nuclear force (M.L.F.) seems to lose sight of what should be the main goal—namely to reduce the chances of war in Europe.

In my opinion the M.L.F., as originally proposed, would create greater instability in Europe, not only because of the Soviet Union's exaggerated fear of the plan, but because it would be the first step toward giving Germany control over nuclear weapons. It would be a step from which we could not easily retreat and which could in a most natural way be followed by further steps in the same direction.

Fortunately, because of strong British and French opposition, the question has now become how to modify M.L.F., or better yet, with what should it be replaced? The Europeans would like to have more say over nuclear policy in Europe and greater confidence that the United States would honor its nuclear commitments to Europe.

### USE OF WEAPONS

The Europeans have good reason to doubt us as long as the plan is to use American nuclear weapons in response to a Soviet attack using conventional weapons. For it would be bordering on suicide for the United States to initiate the use of nuclear weapons in Europe. As a scientist I feel the responsibility to point out that no matter how many more missiles we have than the Russians, the present Russian weapons are quite adequate to devastate the United States, in addition to Europe.

However, our European nuclear commitment could be made believable, if based on two principles: that we would never be the first to use nuclear weapons whether large or "small," and that we are firmly committed to the use of nuclear weapons in response to any kind of Soviet nuclear attack on Europe.

I would go further and advocate giving Europeans equal say in determining our nuclear policy provided it was based on the above principles. I would be willing to give NATO the power without any United States veto to determine a full list of contingency plans on how to respond to various kinds of Soviet nuclear attacks on Europe, provided each response was comparable in strength to the attack. If ever a war should break out in Europe, such a policy would deter the use of nuclear weapons of any kind.

### NUCLEAR WAR ENCOURAGED

Our present policy of employing tactical nuclear weapons against a conventional attack encourages escalation to a war we and everybody else would lose; however, if a European war could be kept conventional, the indications are that we would win. This is substantiated by the studies of the Institute for Strategic Studies in London and recent analyses of Khrushchev's ouster which point out that total allied conventional forces exceed those of the Soviet Union and its European "allies."

Just why the Johnson Administration tried so hard to impose the M.L.F. on unwilling allies I will never understand; however, now that the election is over, let us hope that serious thought will be given to serious matters.

—JAY OREAR

## UPHOLDING THE RIGHT TO TRAVEL

A major Supreme Court decision last June 22 upheld the right of U. S. citizens to travel abroad, in finding that a section of Federal anti-Communist legislation was incompatible with the Fifth Amendment to the Constitution. The 6 to 3 decision reversed a U. S. District Court's ruling, in *Aptheker et al vs. Secretary of State*, that two Communist Party officials had to turn in their passports. The State Department had demanded surrender of the passports in January 1962, under Sect. 6 of the Subversive Activities Control Act, which makes it a criminal offense for a member of the Communist Party (or other "registered" subversive organization) to apply for or be issued a passport.

While the decision dealt only with the specific case, the Supreme Court majority opinion included some quite strong affirmations of the American citizen's "right to travel." The unconstitutionality of Sect. 6 removes the State Department's legal basis for requiring that applicants for a passport certify that they are not members of the Communist Party; such a question has been on passport forms for over a year, following the final registration of the Party under the long-contested Subversive Activities Control Act.

### DR. LAMB'S PASSPORT TROUBLES

The decision came barely in time to provide a happy ending to a controversy between Dr. Willis Lamb, Professor of Physics at Yale and Nobel laureate, and the State Dept. Prof. Lamb had accepted an invitation to teach at the Summer School of Theoretical Physics at Les Houches, France. In applying for renewal of his passport, he had refused as a matter of principle to fill out the non-Communist affidavit, and the State Dept. had refused to process his application. The matter had evoked strong protests from French scientists. The FAS and its General Counsel Daniel M. Singer had interceded with the State Dept., which apparently would not consider waiving its procedures pending the outcome of the case before the Supreme Court. Following the Court ruling, the State Dept. issued a passport to Prof. Lamb on June 29, just in time for him to attend the summer school.

Despite the Supreme Court's decision, passport application forms containing the non-Communist oath (and warning of prosecution under the overthrown Sect. 6) were still in use as of November. The State Dept.'s attitude (as expressed in a recent letter from Passport Office Director Frances G. Knight to Mr. Singer) is that use of the old forms is a "simple matter of economy" which will continue until the present supply is exhausted. Applicants are not advised of their right to omit the non-Communist statement unless they specifically object to it. The Passport Office feels that "since the vast majority of United States citizens who apply for passports do not consider this language offensive, there has been no necessity of calling particular attention to it."

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joint desalting project was agreed upon in June by President Johnson and Prime Minister Eshkol of Israel. A team of American and Israeli experts has been studying the feasibility of a nuclear dual-purpose power and desalting plant for Israel and has concluded that such a plant would "offer an attractive solution for Israel's short-term water problems." As recommended by the joint team, an engineering firm is expected to begin a technical and economic feasibility study of the problem later this year. The team recommended that the engineering consultant study alternative dual purpose plants which would produce between 175 and 200 megawatts of electricity and between 125 and 150 million cubic meters of fresh water each year.

A second possibility is a joint project with Mexico to build a plant in the Gulf of California. Exploratory talks have taken place among representatives from Mexico, the United States and the International Atomic Energy Commission. Finally, representatives of the United States and the Soviet Union met in Washington this summer "to explore the possibility of mutually beneficial scientific cooperation in the development of methods for desalting sea water, including the possible use of nuclear energy." The group discussed the possibilities of cooperation by the exchange of scientific reports, including results from pilot studies, by the arrangement of symposia, and by the exchange of visits by technical experts. The conduct by each country of research and development work in the desalination area would be in accordance with its own program and at its own expense. (Joint Committee on Atomic Energy Hearing on "Use of Nuclear Power for the Production of Fresh Water from Sea Water," 8/18/64; *Forum Memo*, 8/64; *Wash. Post*, 4/2/64.)

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