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

STATEMENT BY FEDERATION OF AMERICAN SCIENTISTS

On the Occasion of the Fifteenth Anniversary of the Explosion of the First Nuclear Weapon at Alamogordo, New Mexico July 16, 1945

In the fifteen years since the first nuclear weapon was exploded at Alamogordo, no agreement on arms control has been concluded. It appears unlikely that the world will avoid a nuclear holocaust if another fifteen years pass without arms control agreements.

A nation may propose arms control to prevent or minimize the horror of war, to strengthen its relative military position, or to gain a propaganda victory. Unless both sides seek arms control agreements for the first purpose no very useful agreement is possible. Although it has been United States policy to seek arms control as a method of preventing war, we have not supported that policy with the necessary conviction and devotion. We must make more creative and intensive efforts to get arms control agreements.

It is clear that our best efforts toward arms control will be unavailing if the Soviet Union is intransigent. But the only way in which we can determine whether they share our goal is by negotiating with them. The goal of such negotiations is an arms control plan—perhaps the first of a series—which will increase our chances of survival and avoid significantly unequal effects on the military strength of East and West. If we make a complete effort to this end and fail, we will know that Russia is seeking arms control agreements only to improve her relative military position or to gain propaganda victories. If we do not make a complete effort, we will have failed to do that which it is in our power to do and which a minimum regard for our safety and our responsibility to mankind requires.

This goal will not be easily attained. The Federation appreciates, perhaps more clearly than many, that workable arms control agreements are difficult to create, propose, and negotiate, even when all parties recognize that such agreements are essential to survival. The scientific and technical problems, as well as the military, diplomatic, and administrative problems, of negotiating an arms control agreement are exceedingly demanding. Solution of the problems requires, at the very least, conviction throughout our Government of the importance of the goal, thorough investigation and evaluation of proposals, and creative thinking to develop all possible routes to agreement.

Even before the first atomic explosion in 1945, American scientists at the super-secret Manhattan project warned their government of the terrifying consequences of an atomic arms race. After the war, atomic scientists established the Federation of American Scientists to inform the public of the promise, and of the threat, of atomic energy. In trying to dispel the easy confidence that the secrecy of our marvellous weapon would protect us for the foreseeable future, the Federation, in 1946, cautioned:

"There is no secret of nature which scientists in other countries cannot learn as readily as we. There is no magic defense against the A-bomb. We must have world control of atomic energy."

In 1946-47, while the United States still held its nuclear monopoly, we proposed and negotiated on the Baruch Plan, a plan that might be called "the whole hog" of nuclear weapons control. Unfortunately the conclusion at that time was that the Soviet Union was unwilling to agree to an adequate plan for preventing the use of nuclear weapons. That major effort to achieve effective control of nuclear weapons failed because the Soviet Union was intransigent. But that was thirteen years ago. A different regime ruled Russia then, and the ICBM and the H-bomb had not yet been born.

Nor have recent efforts to achieve arms limitation agreements succeeded. But this time we do not know that our efforts have failed because of Soviet intransigence. Our efforts have not been complete enough for us to be confident that we would have found a basis for agreement if such existed. Our government has not undertaken on a sufficient scale the hard work and intensive research that are necessary for an informed political judgment on specific arms control proposals. Our country is unquestionably in favor of disarmament in principle. But we seem to fear specific steps because we do not know what risk or gain each step may imply. In short, we have failed to organize the basic information and critical and creative thought necessary to the formulation of arms control proposals based on clear recognition of facts. Furthermore, we are unable to anticipate or analyze adequately such counterproposals as the Russians have offered or may yet offer.

It seems at least probable that the Soviet leaders now share our belief in the value and importance to both our nations—as well as to the rest of the world—of achieving some arms limitation. If this is true our failure to do all that can be done toward seeking such agreements may be a tragic failure indeed.

On this fifteenth anniversary of the nuclear arms race, let us recognize that while time is short, time still remains. We must no longer fail to do our utmost toward seeking arms control. The tragedy of ultimate failure is so great that we must make survival the first order of business and devote generously to the study of disarmament whatever talent and resources may be usefully employed.

SUMMARY STATEMENT BY BOSTON CHAPTER, FAS, ON A NATIONAL POLICY FOR SUPPORT OF FUNDAMENTAL SCIENCE

Prepared by M. D. Kamen *

* During the past year, a committee headed by the writer led discussions in the hope that there might result a statement representing majority opinion of FAS membership on the character of a national policy for promotion and support of basic scholarship in science. This effort was requested by the Executive Committee because it was felt that FAS should be ready to submit specific recommendations, when and if asked by representatives of the Federal government. The discussions were initiated by presentation of a preliminary draft prepared by the writer. The following statement is a considered version as modified by these discussions. It is presented to acquaint the general membership with its content. It should be emphasized that this statement is not intended to be definitive or complete.

Introduction

The FAS believes it is urgent to formulate and implement a national science policy. This concerns the nation because the position of the U. S. as a leader in world affairs must be based on strong continuing leadership in basic scholarship as well as technological skills.

A cooperative effort on the part of business, industry and the government is needed to provide the funds necessary for expanding facilities and faculties in universities and colleges. Since universities and colleges have made possible most past successes achieved by American scientists, future efforts should be concentrated in these institutions. Some general recommendations and some suggestions for specific action follow.

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SUMMARY STATEMENT BOSTON CHAPTER

(Continued from page 1)

General Recommendations:

1. Science policy is in part related to education policy and should not be considered apart from the problem of national educational reform.
2. Minimal standards for curriculum content in elementary and secondary schools consistent with modern knowledge in natural sciences, humanities, and social sciences, must be specified.
3. Teaching standards at the pre-college level should be examined to ascertain their conformance with those changes in curriculum content indicated as necessary in the light of new knowledge.
4. Pre-occupation with teaching methods should not take precedence over intellectual content.
5. Funding practices should be made more flexible to meet the needs of educational institutions in adapting to new scientific developments.
6. The number of agencies in the Federal and state governments concerned with the support of basic research should be minimal. That is, there should be agencies whose sole purpose is the encouragement and support of basic research, but these need not number more than four in the Federal government. Possibly, similar agencies should exist at the state level.

Specific Suggestions

The United States is perhaps the only advanced country which has no mechanism for consideration of the over-all function of its pre-college educational apparatus. One possible remedy is the creation of a Department of Education in the Federal Government. The Secretary of this department should be authorized to set national standards with respect to minimal curricula, teaching requirements, and economic status of the teaching profession. He would press for support of education in the same way other departments, no more vital to the nation's needs, do for commerce, labor, defense, etc. Proper checks and balances on the authority of the Secretary should be created by law.

No distinction ought to be made between training of scientists and non-scientists at the pre-college level. All scholarships need the same fundamental discipline in deduction, communication and perception.

The Federal government should conduct or organize a campaign of instruction which clearly differentiates educational and vocational training.

Scholarship can be best pursued on a long-range basis with freedom from pressures generated by specific practical needs. Federal funds are now authorized on an annual basis and are contingent on the performance of specific "practical" tasks. Legislation is needed which will allow the Budget Bureau to permit long-term commitments.

Industries requiring scientific and administrative personnel should shoulder a much greater share of the cost. Money for Federal support of education could be obtained from taxes on corporate earnings and excess profits.

Many laboratories now scattered through an unintegrated variety of agencies, employ investigators to do "basic research." Such investigators should not be working in agencies whose primary function is technical development.

No more than three Federal agencies should be responsible for basic research in government laboratories and for sponsorship of basic scholarship in institutions of higher learning. At least two of these now exist—the National Science Foundation and the National Institutes of Health.

A possible third agency might consist of the laboratories administered by the Atomic Energy Commission. These could be grouped under a separate wing of this agency. Formal recognition should be given to their divorce from the strictly weaponizing aspects of the atomic energy program.

Reorganization is difficult, for it must be carried out with regard to maintenance of continuity in present basic research programs. But it seems unreasonable that personnel engaged in basic investigation should be located in particular service agencies, such as the AEC, ONR, NASA, etc. apparently because of availability of funds.

Liaison between laboratories engaged in basic investigations and service agencies interested in practical applications could be effected by committees consisting of appropriate representatives of the agencies involved.

Communication between the three basic research agencies should be efficient to achieve the cooperation needed to minimize duplication and waste. This might be achieved by an operations committee made up of representatives from the

NOTES ON PEACEFUL USES

The AEC has announced selection of a contractor for a packaged nuclear power plant at McMurdo Sound in Antarctica. The contract, made with the Martin Co. of Baltimore, calls for a 1500 electric kilowatt reactor at a price of nearly 4 million dollars. The company will design, fabricate, assemble and test operate the plant which will be shipped to McMurdo Sound in units for final assembly and which is to be in operation by early 1960. (Wall St. Journal 8/11)

A delay of from one to two years is forecast in the construction of a 50,000 kilowatt plant at Pierce, Florida. The plant is to be built by two Florida power companies, and the AEC is to bear half the cost of research and development. The extent to which the participating power plants agreed to bear the costs of construction and operation was limited under the initial agreement and dependent on the cost itself. The delay has arisen because of the need for further research on the feasibility of using beryllium instead of stainless steel for shielding. Although this substitution would raise the initial cost of the plant, already increased above original estimates, it would cut operating costs by permitting the use of cheaper grades of uranium. (Wall St. Journal 8/5)

For those interested in detailed reports about 10 power reactor projects under construction or planned, the AEC has published a 34-page literature search, *Selected Reactors of the Power Reactor Demonstration Program*, available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C., for 75 cents. The AEC budget of 2.7 billion dollars, passed by the Senate in August, includes about half a billion dollars for the reactor development program (Science 8/19).

Project Plowshare Criticized

An analysis of Project Plowshare, the AEC's program for the peaceful utilization of underground nuclear explosions, has been prepared by a team of Washington University scientists and released by the Greater St. Louis Citizens' Committee for Nuclear Information (CNI). The main conclusions drawn by CNI are that while some of the scientific experiments included in the project may yield important results, a number of the proposed engineering plans could probably be carried out more effectively by non-nuclear techniques, and others appear wholly impractical. Thus, with regard to the proposal to make a harbor far up on the Alaska coast by setting off three underground nuclear explosions, the scientific team concludes that the cheapness of the method is offset by contamination problems, by shock damage, and by difficulties in predicting the size of the hole to be produced. Another Plowshare proposal is the use of underground nuclear explosions to produce a heat reservoir ultimately to be converted to electric power. This scheme the scientists found impractical from the point of view of cost, contamination, and shock. A proposal to mine useful radioisotopes from the debris produced by underground explosions was considered to be advantageous in the case of isotopes which can be produced only by nuclear explosion. Otherwise, the problems of the scheme outweigh any advantages. A purely scientific part of Plowshare is the proposal to study the behavior of neutrons, produced in an underground explosion, by guiding them into underground testing and recording instruments. The large number of neutrons thus made available for study is an attractive advantage of the proposal; whether or not the advantages outweigh the expense is uncertain. (Greater St. Louis Citizens' Committee for Nuclear Information, Release 8/18)

three agencies. A beginning is already discerned in informal discussions between administrators of the NSF and NIH.

The three agencies should provide the funds to colleges and universities seeking to expand their effort in basic scholarship. Responsibility for various kinds of research can be assigned to the appropriate agencies.

Funds for universities should be provided as long-term institutional grants.

The sums involved are small. The subsidy for higher education described would not amount to more than 0.25% of the national income or to more than 2% of the Federal budget. The sum required per year to support 300 investigators, at a salary of \$20,000 each and with an additional \$20,000 for laboratory facilities, is 12 million dollars. Endowments yielding 12 million dollars annually are not available to most institutions, but annual national subsidies would be quite practicable.

SECURITY AND SECRECY MATTERS

New Clearance Procedures for Industrial Personnel

The Atomic Energy Commission (Federal Register, 7/12) and the Defense Department (Federal Register 8/10) have similarly changed their procedures for determining the eligibility of industrial personnel for access to restricted information. The new procedures apply also for the Federal Aviation Agency and the National Aeronautics and Space Administration. Well-informed Washington sources consider that the revisions will bring about a major change in the handling of clearance for persons employed by contractors of these government agencies. The rulings insure an individual the right to appear personally at a hearing concerning denial or revocation of security clearance. During such a hearing, individuals are now given the right of confrontation, that is, the right to cross-examine a person supplying information to the hearing board. In addition, the individual being investigated must be informed of all information the hearing board has for consideration, except where such disclosures would substantially harm the national security. The decision to withhold information or prevent cross-examination must be made personally by the highest officers within the department affected. In the latter instance, the individual would nevertheless receive as comprehensive as possible a summary of such information.

World War II Science Reports

Scientific reports collected by the Office of Scientific Research and Development (OSRD) during World War II were declassified this month by the Secretary of Defense (W. Post, 8/7). The papers will be made available by the Library of Congress later this fall. The 30,000 odd reports represent the work of American, British and Canadian scientists who worked through OSRD, which was headed by Vannevar Bush. The declassified material covers such areas as metallurgy, radar, communications and chemical warfare, and classifications from confidential to secret. Certain areas are excluded from the declassification order. These include top secret material and atomic energy matters (Manhattan Project, etc.).

State Department Historical Papers

The State Department has suspended its practice of allowing authors to see still classified historical papers (W. Post, 8/24). In the past scholars have been allowed to see material while it was being prepared for release by the Department, on the supposition that publication by the scholar would be later than formal publication by the Department. The cessation of the procedure was precipitated by a series of articles concerning the Potsdam Conference published in the Minneapolis Tribune and Des Moines Register and Tribune. The authors of these articles had had access to Department papers, however the department will not be prepared to publish their documents until 1961.

Next Meeting

As announced in the June Newsletter, the next FAS Council meeting will be held in Chicago on the Friday and Saturday immediately following Thanksgiving, at the same time that the American Physical Society meets in Chicago. If you have suggestions for agenda items, please inform the Washington office.

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Chairman M. Stanley Livingston

The FAS Newsletter is prepared in Washington by FAS members. The staff for this issue were: Editor—John H. Edgcomb; Writers—M. F. Singer, Florence K. Millar.

The FAS is a national organization of scientists and engineers concerned with the import of science on national and world affairs.

FROM THE WASHINGTON OFFICE

Fifteenth A-Bomb Anniversary Release

On July 16, FAS issued a press release, the full text of which is reprinted elsewhere in this issue. Requests for reprints have been heavy and we are running additional copies for further distribution. The release was inserted into the Congressional Record by Sen. Proxmire.

Brode Resigns as Science Advisor

Wallace R. Brode has resigned as Science Adviser to the Secretary of State. It is not clear what has precipitated Dr. Brode's departure at this time, although there are indications that it may have been forced by internal disagreements within the government regarding the extent to which the government would permit American scientists freely to attend international scientific conferences. Dr. Brode was instrumental in revitalizing the science attache program to cover ten foreign embassies.

Dr. Walter G. Whitman, formerly chairman of the chemical engineering department at MIT with extensive post-war experience in the atomic energy field, will succeed Dr. Brode. Dr. Whitman testified strongly in support of Dr. J. Robert Oppenheimer in Dr. Oppenheimer's security case.

Congressional Actions

Congress adjourned without taking final action on any passport bill. The situation, therefore, remains as it has been for the past two years, namely, that the Secretary of State may not deny a passport on the basis of the present or past political beliefs of the applicant.

The Senate Subcommittee on Disarmament has published two valuable studies on disarmament. Both may be obtained from the Senate Committee on Foreign Relations. The first is a reprint of the National Planning Association pamphlet entitled "Strengthening the Government for Arms Control." NL 60-5 reported on a pre-print of this pamphlet available last June. The other pamphlet is entitled "Chemical-Biological-Radiological (CBR) Warfare and its Disarmament Aspects."

Arms Control Research

At long last, a centralized group within the government has been set up to handle disarmament policy. The organization—called the United States Disarmament Administration—will be part of the State Department and its chairman will have the rank of Assistant Secretary. It is doubtful that a chairman will be named prior to a new administration's taking over in January 1961. Moreover, since the professional staff of the new body will number only 20 to 25 people drawn mainly from State, Defense and AEC, it is uncertain how many persons not now on the government payroll will be brought in. Nor is it clear how much money will be available for outside research.

NYTimes (9/10) reported: "The agency will be responsible both for coordinating research on disarmament problems and for making policy recommendations for consideration by the National Security Council and the President. It will also be charged with the direction of international negotiations on disarmament and arms control."

It remains to be seen whether a group as small as this and with day-to-day operating responsibilities will be able to carry out the type of intensive research necessary to an effective arms control research program.

Philip Farley, now Special Assistant to the Secretary of State for disarmament and atomic energy matters, will henceforth deal with atomic energy and space matters. He will continue to guide the nuclear test ban negotiations.

Political Party Platforms

Disarmament and Arms Control:

Democrats say: A fragile power balance sustained by mutual nuclear terror does not, however, constitute peace. We must regain the initiative on the entire international front with effective new policies to create the conditions for peace.

There are no simple solutions to the infinitely complex challenges which face us. Mankind's eternal dream, a world of peace, can only be built slowly and patiently.

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PARTY PLATFORMS

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A primary task is to develop responsible proposals that will help break the deadlock on arms control.

Such proposals should include means for ending nuclear tests under workable safeguards, cutting back nuclear weapons, reducing conventional forces, preserving outer space for peaceful purposes, preventing surprise attack, and limiting the risk of accidental war.

This requires a national peace agency for disarmament planning and research to muster the scientific ingenuity, coordination, continuity, and seriousness of purpose which are now lacking in our arms control efforts.

The national peace agency would develop the technical and scientific data necessary for serious disarmament negotiations, would conduct research in cooperation with the Defense Department and Atomic Energy Commission on methods of inspection and monitoring arms control agreements, particularly agreements to control nuclear testing and would provide continuous technical advice to our disarmament negotiators.

As with armaments, so with disarmament, the Republican Administration has provided us with much talk but little constructive action. Representatives of the United States have gone to conferences without plans or preparation. The Administration has played opportunistic politics, both at home and abroad.

Even during the recent important negotiations at Geneva and Paris, only a handful of people were devoting full time to work on the highly complex problem of disarmament.

More than \$100 billion of the world's production now goes each year into armaments. To the extent that we can secure the adoption of effective arms control agreements, vast resources will be freed for peaceful use.

The new Democratic Administration will plan for an orderly shift of our expenditures. Long-delayed reductions in excise, corporation, and individual income taxes will then be possible. We can also step up the pace in meeting our backlog of public needs and in pursuing the promise of atomic and space science in a peaceful age.

As world-wide disarmament proceeds, it will free vast resources for a new international attack on the problem of world poverty.

Republicans say: Through all the calculated shifts of Soviet tactics and mood, the Eisenhower-Nixon Administration has demonstrated its willingness to negotiate in earnest with the Soviet Union to arrive at just settlements for the reduction of world tensions. We pledge the new Administration to continue in the same course.

We are similarly ready to negotiate and to institute

realistic methods and safeguards for disarmament, and for the suspension of nuclear tests. We advocate an early agreement by all nations to forego nuclear tests in the atmosphere, and the suspension of other tests as verification techniques permit. We support the President in any decision he may make to re-evaluate the question of resumption of underground nuclear explosions testing, if the Geneva Conference fails to produce a satisfactory agreement. We have deep concern about the mounting nuclear arms race. This concern leads us to seek disarmament and nuclear agreements. And an equal concern to protect all peoples from nuclear danger, leads us to insist that such agreements have adequate safeguards.

2. Science Policy (abridged):

Democrats say: We will recognize the special role of our Federal Government in support of basic and applied research.

Space. The Republican Administration has remained incredibly blind to the prospects of space exploration. It has failed to pursue space programs with a sense of urgency at all close to their importance to the future of the world.

It has allowed the Communists to hit the moon first, and to launch substantially greater payloads. The Republican program is a catch-all of assorted projects with no clearly defined, long-range plan of research.

We shall initiate negotiations leading toward the international regulation of space.

Oceanography. Oceanographic research is needed to advance such important programs as food and minerals from our Great Lakes and the sea. The present Administration has neglected this new scientific frontier.

Republicans say: Much of America's future depends upon the inquisitive mind, freely searching nature for ways to conquer disease, poverty and grinding physical demands, and for knowledge of space and the atom. . . .

We pledge our continued leadership in every field of science and technology, earthbound as well as spatial, to assure a citadel of liberty from which the fruits of freedom may be carried to all people. . . .

We believe the federal roles in research to be in the area of (1) basic research which industry cannot be reasonably expected to pursue, and (2) applied research in fields of prime national concern such as national defense, exploration and use of space, public health, and better common use of all natural resources, both human and physical. We endorse the contracting by government agencies for research and urge allowance for reasonable charges for overhead and management in connection therewith. . . .

Copies of the full platforms may be obtained from the respective national committees: Democratic, at 1001 Connecticut Avenue, N. W., Washington 6, D. C.; Republican at 1625 Eye Street, N. W., Washington 6, D. C.

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