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

NEW WESTERN PROPOSALS PRESENTED AT TEST BAN CONFERENCE

The three-power negotiations for a nuclear test ban resumed in Geneva on March 21. With strong support from the new U.S. administration for a genuine attempt to conclude a treaty, and after sufficient negotiation beforehand to agree on a united position, both the U.S. and Britain returned hopefully to this new phase of the talks. Concrete proposals on major unresolved issues were set forth in detail by the new U.S. delegate, Arthur H. Dean, and actively supported by Britain's David Ormsby-Gore. These new proposals include:

1. A concession to extend a moratorium on underground weapons tests to three years; the West had previously insisted on a maximum of 27 months while the Russians have demanded a period of four to five years.

2. A proposal for a research program to improve techniques for detecting underground tests and an offer to allow Soviet scientists to inspect obsolete atomic weapons which the U.S. would plan to use in such research. The latter would require Congressional action to change the current atomic energy law, but the Kennedy Administration has pledged to push for such action in the event of agreement in Geneva on this issue. The U.S. is also willing to let Russia inspect the nuclear devices to be used for peaceful purposes; these too would be of older type. This means, Dean explained, that the U.S. would shelve her more ambitious projects using newer devices in order to reach agreement on the test ban and in the hope of persuading the USSR to join in a "New Frontier" of research on peaceful uses of nuclear energy (W. Post and N. Y. Times, 3/24).

3. Acceptance of a ban on all nuclear explosions in outer space.

4. An agreement to reduce permanent control posts on Soviet territory from 21 to 19 with 2 posts in territory adjoining the USSR. Russia has proposed 15 posts within her territory. Control posts in the U.S. would also be reduced from 17 to 16; the total on British territories would be 14.

5. Agreement to parity in East-West representation on the commission of states to supervise the international control network. The proposal is to enlarge the commission to 11 members—4 Western, 4 Eastern, and 3 neutral. In earlier negotiations Russia has wanted the 7 members previously agreed upon to be 3 Eastern, 3 Western, and 1 neutral; the West claimed that this would place undue pressure upon the single neutral and asked instead for 3 Western, 2 Russian, and 2 neutral.

6. Concession for unanimous agreement on an overall budget figure to carry out the treaty; in effect this gives each power a veto over the total budget figure, although not over specific items.

The U.S. declined to offer any concession on the number of on-the-spot inspections of "seismic" events in Russian territory (Russia has agreed to only 3 per year, the West wants 20), but did propose also 20 inspections in the U.S. and 20 in Britain. They had formerly asked for only 20 for both Western countries together (W. Post, 3/28).

Despite this positive approach, the negotiations did not get off to an auspicious start. Even before the Western proposals were set forth, Soviet delegate Semyon Tsarapkin outlined a new Russian position that would insist on a 3-headed body of administrators instead of the control commission previously agreed upon. He has also indicated that Russia feels that continued weapons testing by France is unacceptable, since Western powers would have access to the results of such tests and so would, in effect, be continuing to test (W. Post, N. Y. T., 3/22). Tsarapkin has

DISARMAMENT NEGOTIATIONS PLANNED

The United States and the Soviet Union have agreed to call for a resumption of East-West disarmament negotiations in Geneva in early August. The August date was a compromise between the U.S. desire for a delay until September, and the U.S.S.R. desire for a May or June date. At the same time agreement was announced on a joint resolution postponing debate on disarmament in the General Assembly of the United Nations until the next Assembly session in September. There is still no agreement on which countries will participate in the talks, but negotiations are continuing between the respective United Nations delegations to resolve this issue. Until the breakdown of talks last June, a ten-nation committee was discussing disarmament at Geneva. (W. Post, 3/15, 3/30)

The recent meeting of the leaders of the British Commonwealth ended with a statement advocating a six-point plan for disarmament. The plan aims at "... nothing less than the complete abolition of the means of waging war of any kind." It includes reduction of armies to levels needed for internal security, effective inspection accompanying each state of the disarmament program, and the establishment of a "substantial and adequately armed" international force to prevent aggression and supervise the process of disarmament. (W. Post, 3/18)

U.S. DEFENSE POLICY OUTLINED

On March 28 President Kennedy submitted to Congress a revised defense budget which stressed the "balanced force" concept of military defense. In a message accompanying the revised budget, the President outlined the assumptions on which the budget is based. These principles represent preliminary decisions on defense policy which have resulted from the current reappraisal of U.S. defense strategy. They were summarized by the President in eight points:

1. "The primary purpose of our arms is peace, not war—to make certain that they will never have to be used—to deter all wars, general or limited, nuclear or conventional, large or small. . . . Neither our strategy nor our psychology as a nation—and certainly not our economy—must become dependent upon our permanent maintenance of a large military establishment. Our military posture must be sufficiently flexible and under control to be consistent with our efforts to explore all possibilities and to take every step to lessen tensions, to obtain peaceful solutions and to secure arms limitations. . . . This budget is wholly consistent with our earnest desire for serious conversation with the other side on disarmament.

2. "Our arms will never be used to strike the first blow in any attack. . . . We are not creating forces for a first strike against any other nation. We shall never threaten, provoke, or initiate aggression—but if aggression should come, our response will be swift and effective.

3. "Our arms must be adequate to meet our commitments and ensure our security, without being bound by arbitrary budget ceilings.

4. "Our arms must be subject to ultimate civilian control and command at all times, in war as well as peace.

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not yet given an official reply to the Western proposals; his response has so far been rather negative, but he has indicated that "the proposals must be studied carefully" (W. Post, 3/28) and that Dean "must be patient in getting Russian answers" because the "proposals will take time to analyze" (W. Post, 3/26).

FEDERAL AID FOR COLLEGE BUILDINGS AND SCHOLARSHIPS DISCUSSED

A bill known as the "College Academic Facilities and Scholarship Act" has been introduced in the House and referred to a Special Subcommittee on Education.

Title I of the bill would authorize a program of low-interest, long-term loans for construction of academic buildings, but require that not less than 25% of the cost of any facility be met from non-Federal sources. Dr. Everett Case, President of Colgate University and Chairman of the Committee on Relationships of Higher Education to the Federal Government of the American Council of Education (ACE), has testified before the Subcommittee. He stated that the omission from the bill of direct grants is a serious limitation. Many public institutions would be barred by State laws from taking advantage of the program, since their authority to borrow is limited to income-producing projects, such as dormitories and dining halls. President Frederick L. Hovde of Purdue University, representing two organizations of Land-Grant Colleges and State Universities, amplified the above position: "For all practical purposes the only way many of our institutions could repay these loans would be through the pledging of student fees," and this would mean a sizeable increase in these fees. "... our institutions may then obtain the classrooms and concomitantly deny to many the opportunity to use them." President Calvert N. Ellis of Juniata College, spokesman for the Association of American Colleges, whose members are relatively small, independent or church-related colleges, reported that initially the membership was reluctant to endorse a program involving Federal grants. However, in January 1961 it adopted a resolution in favor of leaving the choice between loans and grants up to the individual institution. This "dual approach" was also favored by the ACE after a poll showed that 89.5% of the replies approved of this option.

Title II of the bill concerns scholarships for college students and is actually an amendment to the scholarship program of the National Defense Education Act. It would provide amounts ranging from \$17.5 million in the first year to \$113.75 million in the fourth year. It has been estimated that when the program is in full force, the minimum number of scholarships will be more than 100,000, and the probable number more than 160,000. The amount of each scholarship is determined by the individual student's need, with an annual maximum of \$1000. The student would select the institution he wishes to attend, and an annual grant of \$350 will be made to it on his behalf. The scholarships would be administered by commissions appointed in each State and awarded on the basis of achievement and need. Dr. Case, stating the position of the ACE, Dr. Arthur Fleming (former Secretary of Health, Education, and Welfare and President-elect of the University of Oregon), Dr. J. Douglass Brown (Dean of the Faculty of Princeton University), and Dr. Hovde all felt that the program should be administered by the colleges and universities themselves. They stated that college admissions officers have the experience of evaluating the needs of the student which the State Commissions would not have; that these needs frequently can be met by a combination of scholarships and loans, and that the financial aid officers on a campus can plan the program most appropriate for each student; and that a Federal program should not unduly influence the normal distribution of scholarship winners among American colleges and universities, which has happened with the National Merit Scholarship Program.

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WHAT HAS HAPPENED TO FALLOUT?

The last high-yield nuclear weapon was exploded two years ago. What has happened to radioactive debris produced by this and prior devices? An article in the current issue of Nuclear Information (Vol. III, No. 3) answers two questions:

How much strontium 90 has been produced; how much is in the air and how much is on the ground?

How long does radioactive debris remain in the air after a nuclear explosion?

In answering the first question, it was pointed out that each megaton of fission energy produced by a bomb releases 0.1 megacuries of radioactivity into the atmosphere. A final inventory put the strontium 90 level for 1959 at 4.5 megacuries on the ground and 0.6 in the air. These measurements agreed remarkably well with estimates of the megacuries released to the stratosphere calculated on the basis of the megatons exploded in air and surface tests.

The question of how long radioactive debris remains in the air depends upon meteorological factors and upon the location of the explosion. "Debris injected into the lower part of the stratosphere near the Equator has an average storage time of 1-3 years, but debris pushed to higher altitude may show a 5-10 year storage time." It appears that the U.S.-U.K. tests conducted near the Equator distributed debris to most parts of the globe and, indeed, the Sr. 90 in the Southern Hemisphere is almost entirely of this origin. In contrast, the Soviet tests conducted near the polar region contributed most of their fallout to the Northern Temperate Zones.

In their 1958 tests, the Russian contribution was between 0.6 and 0.8 megacuries. This accounted for the difference between a total of 4.2 megacuries on the ground and in the air in July 1958 and 4.9 megacuries in July 1959.

It appears that between 4.8 and 5.2 megacuries of Sr 90 are now on the ground and while 0.2-0.4 remain in the air, the "hot rains" of early 1959 will not be seen again unless major above-ground tests are resumed.

Fallout of major proportions has disappeared.

PEACE CORPS

President Kennedy on March 1 issued an executive order authorizing the establishment of a temporary pilot program for the Peace Corps, and also recommended legislation to set up the Corps on a permanent basis. In the explanatory statement issued with the executive order, Kennedy stressed that the Peace Corps is not to be an instrument of diplomacy or propaganda, but a genuine attempt "to permit our people to exercise more fully their responsibilities in the great common cause of world development" and to participate in the "task of bringing to man that decent way of life which is the foundation of freedom and a condition of peace."

The Corps will not be only an agency of the U.S. Government, but will make use of the resources and talents of private institutions and organizations such as universities, labor unions, and industry. The Americans sent abroad will have specialized training to help foreign countries meet their needs for skilled manpower, but will be sent only into countries where the Peace Corps is wanted and where they will contribute to the welfare of the people.

R. Sargent Shriver was appointed on March 4 as director of the Peace Corps. Mr. Shriver has emphasized that members of the Corps must be carefully selected and trained. After the Peace Corps has begun functioning, training for it will be integrated into the college curriculum of students interested in joining after graduation. The Peace Corps will set standards for language study, and completion of courses in the history, economics, politics and culture of the area to which the student would like to be sent. Final training of the volunteers after college, as well as for those not attending college, will also be necessary.

STUDIES ON AEC REGULATORY PROGRAM RELEASED BY JOINT COMMITTEE

A problem of increasing concern to both Congress and the Atomic Energy Commission has been the division of responsibility between the regulatory and operational activities of the Commission. The fear has been expressed that, in the effort to promote the peaceful uses of atomic energy, the question of safety might become of secondary importance (See FAS Newsletter 14, No. 2). This problem has recently been the subject of three separate studies, all dealing with AEC regulatory procedures and organization. The results of the three studies, carried out by the staff of the Joint Congressional Committee on Atomic Energy, the University of Michigan Atomic Energy Research Project, and the AEC itself were made public March 20. (JCAE Release, 3/20).

The Joint Committee staff study was authorized last year at the suggestion of Congressman Hollifield and Senator Anderson to update a similar study released in 1957. Suggesting a major revision in the regulatory organization of the AEC, the new study proposes that an Atomic Safety and Licensing Board, appointed by the President, be created within the Commission framework to handle the unique problems of licensing. Two members of the Board would be technically qualified while the third would "be skilled in the conduct of administrative proceedings." The plan calls for the Board to exercise final licensing authority and to recommend regulatory standards and rules. This Joint Committee staff study is not a Committee report and its recommendations do not necessarily represent the views of the Committee or its individual members (JCAE Release, 3/20).

The Joint Committee staff proposal represents an intermediate position between the minor organizational changes proposed by the AEC study and the creation of a separate agency as proposed by the University of Michigan Atomic Energy Research Project. The most important change recommended by the AEC study would be the creation of an Office of Director of Regulation reporting directly to the Commission about regulatory matters. The AEC has actually already implemented this change by the designation of an Acting Director of Regulation who is authorized to discharge the licensing and other regulatory functions of the Commission with certain exceptions. These exceptions would include permits to construct private or Government reactors and licenses to operate them, as well as regulations involving a wide range of health and safety matters. Left within the domain of Acting Director of Regulation would be issuance of licenses for industrial and research use of radioisotopes and responsibility for making sure that atomic facilities licensees live up to the terms of their licenses. In already implementing these changes, the AEC has emphasized that its actions do not in any way prejudice possible additional steps the Commission might wish to take following consideration of other proposals for revision (AEC Release, 3/16; Wall St. Journal, 3/20).

The study made by the Atomic Energy Research Project of the University of Michigan Law School urges the total separation of the AEC's regulatory and promotional functions. The study recommends that an atomic energy board, separate from the existing Commission, be appointed by the President to be responsible for all regulatory, licensing and health and safety functions.

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

FROM THE WASHINGTON OFFICE

Senator Humphrey to Speak

Senator Hubert H. Humphrey will be the guest speaker at a public meeting sponsored by FAS in Washington on April 25, 8:30 p.m. Senator Humphrey's topic will be: "Disarmament—Political and Scientific Challenge." The meeting will be held in the North Cotillion Room of the Sheraton-Park Hotel, headquarters for the American Physical Society. The APS will be meeting in Washington during that week. All Washington area FAS members and those attending the APS meetings are urged to attend and bring guests.

FAS Council to Meet

The FAS Council will hold its annual Spring meetings in Washington on Monday, April 24, and on Thursday, April 27. Both meetings will be held in the Conference Room of Science Service at 7:00 p.m. As usual, the meetings are open to all members.

FAS Election Results

In balloting which was extremely close throughout, Dr. John S. Toll, Chairman of the Physics Department at the University of Maryland, was elected Chairman of FAS for the coming year. Dr. L. C. Dunn, geneticist from Columbia University, defeated for Chairman, was selected as a Delegate-at-Large. Dr. Peter G. Bergmann of Syracuse was named Vice-Chairman. Robert Rochlin of GE, Schenectady, defeated candidate for Vice-Chairman, was also named to the Council. In addition to Dunn and Rochlin, the following were elected as Delegates-at-Large: Peter Axel, University of Illinois; Donald G. Brennan, Lincoln Lab, MIT; William C. Davidson, Argonne; Sergio DeBenedetti, Pittsburgh; William A. Higinbotham, Brookhaven; Seymour Melman, Columbia; Philip Morrison, Cornell; Alexander Rich, MIT; Louis B. Sohn, Harvard Law School; Hugh C. Wolfe, New York.

FAS Policy in Action

For at least a decade FAS has been urging upon the Government the need for an extensive research and planning effort in the disarmament field. For an almost equal time, FAS has been virtually alone in this fight. Now, at last, there seems to be a serious determination on the part of the Government to undertake such an effort.

FAS Council members and the general counsel have been in active (but private) communication with those in the Government who will have powerful voices in making the decision on how large the new disarmament agency will be, the character of its responsibilities, and its location within the executive branch. By telephone, letter and long conferences FAS views have been spelled out in detail.

Within a short time, President Kennedy is expected to send a message to Congress asking for a strong, well-staffed, and permanent agency, adequately funded to carry out paper studies and contract research, as well as to back up the negotiating process. Two major points are still under discussion: (1) the chain of command from the new agency's head (presumably Mr. McCloy will stay on) to the President—whether McCloy will report directly to the President or whether McCloy will have to go through Secretary of State Rusk; and (2) whether and to what extent the new agency will have responsibility and funds for "hardware" research, such as Project Vela.

If the broad outlines discussed above are preserved in the President's request, the proposal will merit the mounting by FAS of a publicity and public information effort comparable to FAS's 1946 effort to assure civilian control of the post-war atomic energy program. More of this in the May Newsletter.

FAS Membership

Our membership has not kept pace with the growth of the scientific community over the past few years. Recruiting members from a highly individualistic community is difficult and is best accomplished by personal contact. We hope shortly to send chapters and branches materials which may be used to increase our support and, thereby, the effectiveness of FAS with respect to solving the difficult problems facing this country.

WATER POLLUTION— A GROWING PROBLEM

"Pollution of our country's rivers and streams has, as a result of our rapid population and industrial growth and change, reached alarming proportions. To meet all needs . . . we shall have to reuse the same water, maintaining quality as well as quantity" (from the President's message to Congress on natural resources, 2/23/61). The multi-faceted nature of water pollution is outlined in a report on pollution abatement prepared for the Kerr Committee on water resources.

The "traditional" water polluting substance is of course sewage, but certain other materials, discussed below, present difficult problems especially if water is to be re-used. The amount of sewage pollution is measured in terms of the bacterial oxygen requirement for metabolism of the sewage. If the pollution load is great, aerobic bacteria may completely deplete the oxygen supply, and then anaerobic bacteria take over, causing the foul smell characteristic of grossly polluted water. Our rivers are already receiving twice as much pollution as was considered allowable in 1955, with specific areas much worse; and the total municipal sewage load is expected to triple in the next 40 years. Although the "biochemical oxygen demand" should not rise greatly during this period if plans are realized for treating 80% of raw sewage, certain other problems will arise.

For example, sewage nitrogen and phosphorus is not removed by treatment. Since these elements are plant nutrients, they stimulate extensive growth of water plants, especially algae, which subsequently die and decay causing secondary oxygen-demanding pollution. Certain of the algae are poisonous and have accumulated in some waters sufficiently to cause death of animals. In recent years household detergents, insecticides and herbicides have appeared in increasing amounts in our streams. They are not removed by municipal sewage treatment. Herbicides have caused destruction of aquatic life, both plant and animal. Prolonged exposure to small quantities of insecticides has resulted not only in toxicity to fish but also in impaired fertility in birds. The problem is serious enough so that it may be necessary to curtail widespread general use of insecticides and reserve them for specific applications. Other water pollutants include infectious agents, acids, radioactive wastes, and heat.

Examples of these various types of water pollution are readily found within the nation. Bacterial pollution caused temporary closure of beaches at almost every major city on the Great Lakes in 1959. During the summer and fall, the flow of the San Joaquin River is composed largely of irrigation return waters, containing excessive amounts of fertilizer, insecticides and herbicides. In one eastern survey of over 2000 wells only 43% of dug wells had satisfactory coliform counts. This is one aspect of pollution of ground water,

U.S. DEFENSE POLICY

(Continued from page 1)

5. "Our strategic arms and defenses must be adequate to deter any deliberate nuclear attack on the United States or our allies—by making clear to any potential aggressor that sufficient retaliatory forces will be able to survive a first strike and penetrate his defenses in order to inflict unacceptable losses upon him.

6. "The strength and deployment of our forces in combination with those of our Allies should be sufficiently powerful and mobile to prevent the steady erosion of the free world through limited wars; and it is this role that should constitute the primary mission of our overseas forces. . . . In the event of a major aggression that could not be repulsed by conventional forces, we must be prepared to take whatever action with whatever weapons are appropriate. But our objective now is to increase our ability to confine our response to non-nuclear weapons, and to lessen the incentive for any limited aggression by making clear what our response will accomplish.

7. "Our defense posture must be both flexible and determined. . . . We must be able to make deliberate choices in weapons and strategy, shift the tempo of our production and alter the direction of our forces to meet rapidly changing conditions or objectives.

8. "Our defense posture must be designed to reduce the danger of irrational or unpremeditated general war—the danger of an unnecessary escalation of a small war into a large one, or of miscalculation or misinterpretation of an incident or enemy intention. . . . we must make certain that our retaliatory power does not rest on decisions made in ambiguous circumstances, or permit a catastrophic mistake."

The President proposed an increase in the number of Polaris submarines and of Minuteman missiles to be placed in protected underground sites. Additional money was also provided for satellite systems for detecting missiles and for reconnaissance. At the same time, additional funds were provided for a modernization program for the Army, and training in guerrilla warfare is to be expanded. Development of the B-70 supersonic bomber is to be drastically cut back, and the atomic airplane will be canceled as a military project and transferred to the AEC for research.

which may also be contaminated by other substances such as household detergents, or by salt in areas where excessive pumping of ground water has allowed sea water to flow into the ground water reservoirs. Since ground water degradation is usually cumulative and insidious, it is far more serious than similar contamination of relatively transient surface waters.

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