

F. A. S. NEWSLETTER

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No. 58-8

October 27, 1958

TEST BAN TALKS — CAN AN AGREEMENT BE REACHED?

Hopes that Oct. 31 might signal the end of nuclear weapons testing for all time have been dampened by recent developments at home and abroad. To review briefly, the Soviets, on March 31, after completing an extensive series of tests and after the Spring-Summer schedule for American and British testing had already been released, announced that they would end bomb tests providing other nations did likewise. Although a cancellation of the scheduled tests was refused after the release of the report of the Geneva meeting of the technical experts, the US and Britain counter-proposed to cancel their scheduled tests on August 23, and to suspend tests for one year beginning October 31, providing the Soviets would also refrain from testing during this period and would join in negotiations to implement the global blast-detection plan worked out in Geneva. In addition the Western powers proposed to prolong the suspension on a year-by-year basis providing "progress is made toward real disarmament."

Russian Tests Resumed

On Sept. 30, however, the Russians began another full scale series of bomb tests at their arctic proving grounds. Ostensibly, reason for this resumption was the continuing US and British tests. Foreign Minister Gromyko in fact maintained that it was necessary for Russian security that the USSR equal the number of test explosions set off by both the US and Britain "over the whole period of tests." According to Hanson Baldwin (N. Y. T., Oct. 19) this apparently referred only to tests since March 31—a total of at least 43 by Oct. 9—not those "from the time of Adam and Eve." However, Deputy Minister Zorin told the UN General Assembly four days later that at least 100 more explosions would be necessary.

The State Department viewed the new Soviet tests as confirmation of its original view that the Russian ban had been only a "propaganda exercise," and was supported editorially by the *Times of India*, which concluded that "Moscow's so-called voluntary test ban was timed to coincide with the period of six months that usually separates one series of experiments from another." (N. Y. T., 10/14). The Soviet action was also denounced by British Minister of State, Allan Noble, as an ultimatum, in that the threat "to go ahead with nuclear tests unless Western powers here and now agree to the Soviet proposals" was an effort "to stampede the UN into a hasty declaration calling for a ban on tests before a system of controls has been set up." (W. Post, 10/15)

UN Maneuvers

As almost daily Soviet and US (Nevada series) blasts augmented global fallout, and rumors of the possible entry of France and Sweden into the bomb-making business were heard, a resurgence of long-familiar wrangling in the UN muddled the political picture. Two days after Soviet tests resumed, Moscow accepted the invitation to the Oct. 31 Geneva conference, but demanded that it be conducted at the foreign minister level rather than by disarmament specialists as proposed by the US and Britain. This gambit was construed by Western observers as an effort to force a high level decision on disarmament by trading on the tight schedule of top diplomats, and to exert pressure for the admission into the UN of Red China, on whose territory some of the 180 checkpoints proposed by the earliest technical conference would presumably be located. Mr. Dulles and his British counterpart have rejected the idea of high-level involvement, at least in the first stages of the Oct. 31 conference.

In the UN General Assembly, the pressure to end testing prior to Oct. 31 has culminated in formal resolutions by Russia (Oct. 4), India (Oct. 5), and India plus 11 other Afro-Asian countries (Oct. 14), calling for an immediate ban. The Russian stand was presumably directed to the same end as the call for a high-level meeting—to force the West into an agreement on an unconditional and permanent termination of the tests, following which discussions about inspection and controls could continue indefinitely. While Mr. Gromyko emphasized that the Soviets' resolution would not be binding upon any country, the move was apparently considered to have sufficient propaganda value to justify a US-inspired resolution by 17 nations calling for a test cessation during the coming Geneva talks. A further obstacle to agreement is the additional US reservation that the Geneva talks consider exempting nuclear explosions for peaceful purposes from the ban. This proviso, said to have been the price of Pentagon-AEC accession to the Administration's current policy, poses a very knotty question of defining "peaceful purposes" and is sure to meet with violent Russian objection.

Leaks or Espionage

The Soviet demand for a permanent and unconditional (as well as immediate) test ban—in opposition to the equally adamant Western insistence on no test moratorium without guaranteed inspection and control—is an old, familiar story. The current Soviet justification, however, is new and has interesting and puzzling implications. The Russian argument is that prior agreement on inspection and controls is no longer necessary because the conference of experts agreed that test-monitoring is feasible. In support of the existence of a foolproof detection system the Russians point to the fact that they detected 32 US Pacific nuclear tests between April 28 and July 26, whereas the US had officially announced only 14.

The admitted accuracy of the Soviet list of US tests is said to be causing concern to Pentagon and AEC officials who suspect "leaks of espionage" because, it is claimed, "the Soviets could not possibly have detected the blasts by any instrument known to the US." (Wash. Post, 10/11) The incident is reportedly being used to intensify the long-standing Pentagon-AEC opposition to banning nuclear tests and to cast doubt on the value of the proposed global test detection system. However, a much improved blast-detection range is claimed for a new long-period seismograph developed by Columbia's Lamont Observatory, and tests of an extra-short period machine are being conducted by the US Coast and Geodetic Survey, (N. Y. T., 9/30).

Russian Subs

Most observers were inclined to attribute the Soviet success in detecting the low-yield Pacific shots neither to the claimed Russian detection system operating at 3100 to 3700 miles distance nor to leaks and espionage but to Russian submarines within the 400,000 square mile test area. Nevertheless, the whole episode raises a number of interesting questions. Did, for example, the Russians report 32 US shots, in order to encourage the test ban or to force the US to admit concealment? Why has the US consented to a year's test suspension without controls, if it expected that shots of the type used in more than half of the Pacific series would be undetectable? Has Russia in fact a better monitoring system than the US?

(continued on page 2)

NASA IS BORN FIGHTING

The National Aeronautics and Space Administration, which began functioning October 1, has already become involved in a bitter dispute with the Army. The civilian-controlled NASA, created by Act of Congress to supervise the government's non-military efforts in space and aeronautics research, took over the personnel and facilities of the National Advisory Committee for Aeronautics, and other government projects including the Vanguard satellite program.

The focus of the present controversy is the proposal that 2100 scientists and technicians at the Army's Redstone Arsenal, in Huntsville, Alabama, be transferred to the NASA. The Army has fought hard to retain its missile team which is headed by Dr. Wernher von Braun. Dr. Von Braun, protesting the proposed transfer, said; "It would seem something less than prudent to risk the dissolution of such an asset at a time when the national security and prestige demand a unified effort to achieve and maintain supremacy in rocket and space technology." (*W. Post*, 10/16).

Final decision on the proposed transfer will be made by the President on the advice of the newly-formed 8-man National Aeronautics and Space Council.

Other Space Developments

At the meeting in Washington, October 3, of the General Assembly of the International Council of Scientific Unions, a group called the Committee on Space Research was formed. COSPAR's function will be to extend the international cooperation which characterized the IGY program to space research.

A staff report of the House Select Committee on Astronautics and Space Exploration has proposed the formation of an international body to promote the peaceful conquest of space. This group, unlike COSPAR, would have governmental as well as scientific representation. In addition to providing means for scientists of all nations to cooperate in space research, the group would seek to avoid the threats to peace inherent in a race to conquer space.

CONTAMINATION OF OUTER SPACE

The past year has witnessed man's successful breaching of the space barrier that has heretofore confined his explorations to this planet. The orbiting satellites and the more recent successful launching of the Pioneer moon probe rocket point the way to an early rocket landing on the moon and an eventual landing on the more distant planets. The possibility that the moon and other celestial bodies will be contaminated by exploratory rockets is so real that a Committee on Contamination by Extraterrestrial Exploration (CETEX) has been set-up by the International Council of Scientific Unions (ICSU). CETEX met at the Hague in May of this year and the recently released record of the meeting is essentially a fact sheet of the problem.

What types of contamination are expected and can they be controlled? These are the questions that the Committee considered. In the case of the moon, the contamination to be prevented would be mainly physico-chemical rather than biological. The deceleration of a rocket requires the release of tons of chemical propellants which could unquestionably spoil the moon's atmosphere. Thus the Committee recommends that initial exploration be carried out by orbiting the moon rather than by a direct landing. It was suggested that the release of a chemical marker on the moon should be in the nature of a small amount of a substance not normally found in the moon's atmosphere.

Attempts to obtain information by nuclear explosions on the moon would lead to radioactive contamination of the surface and could seriously interfere with subsequent radiochemical analysis so valuable in the study of past lunar history.

CETEX proposes that the member nations of ICSU prepare detailed papers bearing on these topics for presentation at the next meeting of the council this fall, so that a specific code of conduct for space exploration may be drafted.

RADIATION AND FALLOUT

Current activity directed to dealing with problems of radiation and fallout at this stage of the atomic age can be conveniently grouped as follows: 1. the nature of existing and anticipated contamination in terms of isotopic identity, quantitative aspects, and rate of entry of the known isotopes into the biosphere, 2. short and long term effects of known radiation to humans, 3. protection of the population from possible nuclear attack, and 4. plans for recovery after a nuclear attack.

Tested according to the above categories, the following are brief summaries of recent developments concerning radiation and fallout:

Secretary Flemming, of the Department of HEW, said the public should be kept informed on radioactive contamination from atomic energy installations and hazards of poorly safeguarded X-ray machines (*N. Y. T.*, 9/23/58). A detailed report by E. C. Anderson in *Science* (Vol. 128, page 882) presented an analysis of the gamma emitters cesium-137 and potassium-40 in people and milk. The concentration of these isotopes in milk from different areas correlated with the amount found in humans. The concentration in milk was also correlated to degree of rainfall and general fallout.

Dr. E. P. Laug and Wendell C. Wallace of the Food and Drug Administration have reported a rise in the radioactivity of tea, dairy products, and certain sea foods since 1945 (*W. Post*, 10/16/58). Dr. M. Finkel of the Argonne National Laboratories reported in *Science* (Vol. 128, page 637) that there appeared to be a threshold value for strontium-90 with respect to cancer production and life shortening. The whole tone of Dr. Finkel's findings which were obtained from work on mice but which also considered data on dogs and cats, would tend to lessen the significance of strontium-90 as a major hazard. More work on this point is urgently needed. American radiologists have charged that the public is too cautious in its attitude regarding X-ray examinations (*N. Y. T.*, 10/1/58). A meeting of the College of Surgeons, on the other hand, urged more discriminating use of X-rays by physicians. Radiation from several luminous dial wrist watches was found to be excessive by Drs. Chase and Osol of Philadelphia (*N. Y. T.*, 10/3/58).

Old victims of radiation either through accident or by profession are being sought for a study of long term effects by researchers at M.I.T. (*N. Y. T.*, 10/9/58).

The Committee for Economic Development said the nation should and could afford any outlay for defense requirements in the atomic age (*W. Post*, 10/3/58). Radiation dangers to different types of public buildings are being tested on Army structures in Boston (*N. Y. T.*, 10/12/58). Radiological decontamination techniques are being tested on the West Coast by the Navy (*N. Y. T.*, 10/12/58).

Dr. Libby of the Atomic Energy Commission has discussed ways of decreasing casualties during and after a nuclear attack. His paper was presented to an AMA symposium in Chicago (*W. Post*, 10/17/58).

TEST BAN TALKS (continued from page 1)

In sum, as Oct. 31 approaches no one can say whether the meetings at Geneva—if they came off at all—will mark the first break in the twelve-year-old disarmament deadlock. In a thoughtful summing-up of the prospects, the *Washington Post* (Oct. 10-15) remarked editorially "It would be wrong to attribute more to an international test suspension agreement, even with adequate inspection, than it really could accomplish. It was proposed, not as a disarmament measure in itself nor as a check against espionage, but as a means of building confidence. To a certain extent it also would relieve fears that radioactivity from large tests is harming human health. The possibility of evasion with small weapons undoubtedly will exist; but it is the large explosions that are most significant, particularly from a health standpoint, and these are by general acknowledgement readily detectable. If an inspection system operated successfully other more significant measures might stem from it. And it should be feasible to make provision for international scrutiny of nuclear explosions for peaceful purposes which have exciting possibilities."

BRIGHTER THAN A THOUSAND SUNS—A PERSONAL HISTORY OF THE ATOMIC SCIENTISTS

By Robert Jungk

Harcourt, Brace and Company, 341 pp. \$5.00

From 1939 to 1945 the nuclear physicists of the Western world made history. They did not write it. Robert Jungk has determinedly set out to make the scientists sorry about much of the history they made. It is much more likely, however, that he will make them regret not having recorded that history themselves. With their typewriters, the generals of Guadalcanal and Normandy now fight more fiercely than ever, for on two fronts they fight each other, as well as the Germans. Why do not Conant, Oppenheimer, Szilard, Groves and Teller tell us the story of the development of nuclear weapons?

One answer would be that generals retire, but scientists do not. Since 1945 Montgomery has hardly been as busy as Teller and Oppenheimer. Another answer would be that generals are always interested in mass opinion while, until recently, scientists have not been.

So Robert Jungk is the first man to attempt to write the history of The Bomb as a social-political-personal story of our atomic times. In this reviewer's opinion this constitutes his first mistake. He should not have tried to cover the spirit of Gottingen in the Twenties, the days of 1939 and 1940, the Manhattan Project, the scientists' (F.A.S.) 'crusade in Washington', as well as the intricacies of the 'Oppenheimer Case' in one book. When on top of this, he tries to show that German physicists could have made a bomb but did not do so out of moral scruples, he really stirs up a storm.

Personal Memories

In trying to detail what each of a sizable group of men did and thought about over the course of thirty world-shaking years, Jungk is handicapped by having to rely on the personal memories of those concerned for facts. Many of the situations are obscured in secret documents and, as psychologists have proved, people tend to remember things selectively. Some people wilfully lie, almost all unconsciously lie, and only the brightest and best insist on saying 'I don't know' at each pertinent instance. Jungk is further handicapped because he does not recognize the inadequacy of his factual record, a record compiled simply by talking to the people involved.

Even more dangerous is Jungk's assumption that after asking a lot of people a lot of questions one may neatly describe a man's soul and spirit. The transcript of the Oppenheimer hearings reflects this attitude and Jungk's slanted reading of those slanted proceedings may sometimes be on target and sometimes be 180 degrees off.

The author's treatment of Klaus Fuchs is strange indeed. Many words are used to suggest that Fuchs is to be judged neither as a traitor nor as a schizophrenic and the unwary reader could be led to believe that Fuchs' actions were dominated by religious and pacifistic motives. This same book is merciless to Oppenheimer and his motivations. One does not have to 'treat Oppenheimer like Jesus' to avoid considering him as Judas.

Many well-informed readers of this book will be disturbed at Jungk's attempts to show that German physicists were really torch-bearers for pacifism and carried on a well thought out and organized sabotage of German efforts toward nuclear armament.

Question of Fact

It will be difficult for future historians to unravel the atomic story and their troubles will be confounded by Jungk's attempt to state the facts. Most scientists familiar with these events may perhaps wish that H. D. Smyth had been required to linger on chained to his wartime desk, until he had finished a social-political history of the bomb. If you see a fact in the Smyth Report, it is so. Some of the things in this book are so and some are junk that someone has unloaded on Jungk, and some are Jungk that he is unloading on the reader.

It is important for the reader to know that Jungk is a conscientious objector, and this reviewer finds the omission of this fact from the book less than candid. When a man writes at length about the moral standards of others, we have a right to be told on what morality the judge himself stands. So we find this book lacking in that it gives hundreds of value judgements on scientists, while the judgements themselves are based on questionable factual information and the author's values are not explicitly stated.

MIKE AMRINE

USE OF NUCLEAR WEAPONS

In a speech at the National Press Club (Oct. 7) Vice Admiral Charles R. Brown deplored the use of even small atomic weapons in limited war lest this bring on a general nuclear conflict. Admiral Brown, who has just left the Sixth Fleet and will take over the Allied Forces in Southern Europe next month, declared that there is no dependable distinction between tactical and strategic situations. This view questions a major tenet of the defense policy of the US and its Western Allies which is currently based on the possession and possible use of tactical A-bombs to counter-balance the manpower and probable superiority in conventional arms which the Communist bloc countries have. As quoted by the N.Y. Times, (10/8), Admiral Brown stated, "I would not recommend the use of an atomic weapon no matter how small, when both sides have the power to destroy the world."

During the same week, another American Commander, Gen. Earle E. Partridge, head of the North American Defense Command, called attention to the fact that his command is authorized to fire a nuclear weapon without specific approval from President Eisenhower. No other command has this authority. Even the SAC may not loose its long range bombers and missiles on the enemy without specific word from the White House.

The North American Defense Command was given authorization to use nuclear weapons at its own discretion when the joint Canadian-United States command was set up in 1957. It was assumed that there could be no mistaking the intent behind a direct enemy attack against the US and Canada, and that no delay in interception and retaliation could be tolerated.

It was further pointed out that should the American commanding general be absent, the authority to use nuclear weapons would be in the hands of the Canadian deputy commander, now Air Marshal C. Roy Slemon.

The FAS is a national organization of scientists and engineers concerned with the impact of science on national and world affairs. The Newsletter is prepared in Washington by FAS members. The staff for this issue include: Editors: M. Elkind, L. Herzenberg, F. K. Millar, E. Shelton and M. Singer. Writers: L. Herzenberg, J. Buck, H. Goolman, R. Hendler, F. Stern, T. Osgood, E. Shelton, and D. A. Melnick. Production: I. Shapiro, of the Washington Office Staff.

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Report From Kitzbuehel

At the conclusion of the Third Pugwash Conference, held at Kitzbuehel, Vienna, Austria in September, a group of scientists representing 20 countries endorsed a declaration stressing the necessity to prevent future wars and appealed to their colleagues everywhere to inform the world's people of the dangers and potentialities arising out of the unprecedented recent growth of science and technology. The 4 day conference, sponsored by the Austrian Government, was attended by over 70 delegates, including representatives from the US, USSR, India and Japan.

Noting that a full-scale nuclear war would be a world-wide catastrophe and that defense against nuclear attack is extremely difficult, the declaration emphasized that "unfounded faith in defensive measures may even contribute to an outbreak of war." The conference rejected the idea that future wars might safely be localized or fought for limited objectives, without exposing the world to the risk of "catastrophic consequences." The scientists declared that "any step that mitigates the arms race, and leads to even small reductions in armaments and armed forces, on an equitable basis and subject to necessary control, is . . . desirable," and went on to express the hope that the recent work of the technical experts in the field of detecting test explosions would be followed by an international agreement, leading to cessation of all nuclear weapons tests.

Recognizing that a completely reliable system of controls for nuclear disarmament has been made extremely difficult by the accumulation of large stocks of nuclear weapons, the conference emphasized that, for disarmament to become possible, nations may have to rely on a combination of political agreements and successful experience in the fields of security arrangements and international cooperation, as well as upon technical procedures.

With respect to bomb tests, the declaration recognizes that much uncertainty still exists regarding the extent of the biological and genetic hazards associated with such tests, and cautions that this uncertainty should lead to "a prudent acceptance of the most pessimistic assumption" with respect to further testing.

Much of the Vienna declaration is devoted to the responsibility of science and scientists in the service of peace and international cooperation. "As scientists," the statement reads, "we have an important contribution to make toward establishing trust and cooperation among nations." By working together toward common intellectual goals and by collaborating in ventures such as the IGY, scientists can help bridge the gaps between nations, strengthen the community of nations, and contribute to a climate of mutual trust which is necessary for the resolution of political conflicts.

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PUBLIC HEALTH ISSUES

Both the Senate and the Administration are working on plans to increase the role of the US in international health programs. At the close of the last session of Congress, Sen. Lister Hill (D. Ala.) introduced a bill proposing the establishment of a National Institute for International Medical Research as part of the National Institutes of Health (NIH). The new Institute would use its proposed \$50 million annual appropriation to encourage and support research and the exchange of information on research, the training of research personnel and the improvement of research facilities throughout the world. Although there was not enough time for the bill to be acted upon when it was introduced, it received an enthusiastic reception, and Sen. Hill intends to reintroduce it when Congress convenes next January.

Also scheduled for January is a survey (by a Subcommittee of the Senate on Government Operations) of international health programs in which the Government is directly engaged and/or which it financially supports especially medical research and service programs. The goal of the Subcommittee is to determine how Congressional policies in the international health field "are actually being implemented." The Subcommittee will also look into the relation between official and private overseas health activities. Besides many government agencies with international health programs, a large number of private organizations (including FAS) have been asked to present pertinent information.

The Administration has not yet made public any plans for increased participation in international medicine. However, the Dept. of HEW has a group at work developing a program and Secretary Arthur S. Flemming has placed the head of the group, Dr. H. Van Zile Hyde, on his own staff. If the group is successful in working out a plan, it is expected that President Eisenhower will present it as his international health recommendation in his next special health message to Congress, and would include in his next budget message a sum for carrying the program forward. (N. Y. T., 9/26)

FTC and Antibiotics

The Federal Trade Commission has charged the six leading makers of antibiotics with price fixing, and has accused Chas. Pfizer & Co. of submitting "false, misleading and incorrect information" to obtain its tetracycline patents. Pfizer, and the five companies Pfizer licensed to produce the drug, account for all sales of tetracycline (achromycin, terramycin, etc.) which last year totaled more than \$100 million dollars, according to the commission. The hearings are scheduled to take place shortly after the 1st of January. (N. Y. T., 9/28).

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FAS COUNCIL TO MEET

The Fall meeting of the FAS Council will be held at the Columbia University Men's Faculty Club, 400 West 117th St., New York City on Saturday, Nov. 22nd starting at 2 P.M. This is an open meeting, as are all FAS meetings, and all members who can possibly do so are urged to attend as observers.

The following are two expressions of opinion by individual members on FAS policy which have been received by the FAS office. These are published in full at this time to stimulate thought, discussion and suggestions by the membership. Comments should be directed to the Washington Office which will see that they are brought to the attention of the Council. It is hoped that, consistent with space considerations, expression or opinions from FAS members can be published from time to time in Members' Bulletins.

IS A TEST BAN ENOUGH?

by Mortimer M. Elkind

Dr. Elkind is a biophysicist who was a member of the Executive Committee of the Federation of American Scientists, 1956-57:

For some time now, forward looking, politically orientated individuals and groups in this country and abroad have advocated a moratorium on the further testing of nuclear weapons as an initial and significant disarmament step. During the past twelve years, when disarmament negotiations were uniformly fruitless, there were many who saw in the very nature of the device which threatened the continued existence of mankind two aspects which might serve to minimize and eventually (hopefully) eliminate that threat. These were: 1) the characteristic and inherent self detectability of nuclear weapon explosions by virtue of the fission product and neutron induced radioactive fallout; and 2) the fact that a test suspension agreement would represent a significant initial disarmament step.

The validity of the first aspect rested on the recognized fact that large explosions (certainly those larger than a 100 kilotons and probably those larger than a Nagasaki size bomb, about 20 kilotons) could be detected by monitoring stations outside national boundaries. The validity of the second aspect rested on the apparent needs, to reduce world tensions, to eliminate "third, fourth, etc." power nuclear weapon capabilities, to prevent the development of weapons of even greater destructibility, and, most important, to establish an area of international agreement—however limited it might be—to serve in time by precedent as a device for generating international security and thus pave the way to more inclusive disarmament steps. An additional argument presented by scientists in this country was that a test suspension would be militarily in our favor since our nuclear capabilities were more advanced than those of the Russians. While this has probably been true, it also has been clear that in time the Russians would surely overtake us. It is perhaps a tribute to the weapons specialists in the US that we are apparently still ahead according to two recent reports by non-government groups (i.e., Committee on Security Through Arms Control of the National Planning Association, and the Institute of War and Peace Studies at Columbia University). Nevertheless, the Russians have undoubtedly made considerable progress.

The Question of Fallout

In addition to the preceding, considerable attention and publicity, often of an emotional nature, was paid to the biological hazards of fallout. Present knowledge does not permit an understanding of the detailed nature and magnitude of the potential hazard of current levels of fallout. Still the humanistic justification of such considerations is undeniable if evaluated in the context of a world in which right and justice prevail. In such a context, the life and well-being of even a single individual or his successors should be inviolate. But the world in which we live has not been governed by the ethical considerations which are thought

to characterize civilized man. Because of this, because until now fallout has contributed an average increase in chronic radiation exposure of only 5 to 10 percent compared to background, and because the possession and continued development of nuclear weapons on the part of the US has been until recently the principal deterrent to world war, it has been the opinion of many including my own that the present potential biological hazards associated with fallout by themselves have not constituted sufficient justification for a test suspension.

While the arguments favoring a test suspension of large weapons have remained essentially the same, in the past year or two proponents of progressive disarmament have refined their analyses. This was done to consider the feasibility of detecting nuclear explosions of all sizes and under least in part, by the desire to insure that a suspension all possible conditions of test. This has been motivated, at least in part, by the desire to insure that a suspension agreement could be essentially all inclusive and would not require roving inspectors if fixed monitoring stations within national boundaries could be agreed to. The Killian Committee's report to the President appears to have supported this thesis which probably led to the President's suggestion of feasibility discussions by Western and Eastern bloc technical experts at Geneva. As matters now stand, the Administration, which in the past had distinctly opposed any consideration of a test suspension, now appears to be actually engaged in the technical considerations preliminary to an international agreement. There is as yet no concrete indication that our Government will support a test agreement by itself. Still the unanimity and optimistic nature of the report issued by the specialists who met in Geneva appears to have led to considerable change in our Government's position.

The Missile Age

Aside from unforeseen crises which threaten the albeit precarious stability of the world, like the Middle East and Formosa crises, there has been one event which seems to have been ignored and which surely requires evaluation in these connections. That is the advent of the missile age which dawned with the successful launching of Sputnik 1. The military aspects of this notable scientific achievement make it clear that the era of push button warfare is imminent if, in fact, it has not already arrived. With the recent announcement by the Air Force (Wash. Post 8/2) that an all inertial system for guiding missiles has been developed, the ability to detect missile launching sites by such evidences as radio antennae, etc., becomes practically impossible. And whether or not an intercontinental device will ever be an operational reality is of little importance if shorter range missiles at advanced bases and on submarines are or will be soon practical. There may still be some question as to whether or not current models of these devices can carry H-bomb warheads of current design, but there seems to be little reason to doubt that conventional fission weapons of considerable size cannot already be delivered. In view of these considerations, just how far toward disarmament will a test suspension take us? In my opinion not very far at all.

In addition, there is need for seriously considering the wisdom of such a move at this time. Even if the testing of nuclear weapons is terminated by international agreement, the development of missiles will proceed unbridled. If, as yet, the marriage of the oversize nuclear warhead with the underpowered ICBM has not been made, a test suspension will serve only to postpone the day when missiles will be powerful enough to run their courses carrying warheads of current size. Further, since the Russians are apparently ahead of the US in missile development, the possibility must be recognized that a test suspension alone may put us at a military disadvantage. That the Russians are still behind in bomb development may be true, but this may be more than offset by their ability to deliver much larger warheads via sputnik-type missiles.

From the preceding, it appears quite unlikely to me that a test suspension at this time would represent a significant disarmament step. In view of the present missile race, even if the Middle East were returned to the status quo of twenty years ago and a solution were found for Formosa, is it realistic to believe that a test ban would ease world tensions? Admittedly, most of the political arguments favoring a test ban still stand by themselves, but the Sputniks have taken most of the starch out of them.

(continued on page 6)

PROPOSED EXTENSION OF FAS STAND ON TEST BAN

By Owen Chamberlain, Geoffrey F. Chew, Earl K. Hyde,
Robert Karplus, John O. Rasmussen, Arthur H. Rosenfeld.
(Members of the Berkeley Branch)

Those of us who have long been urging some world-wide limitation of nuclear-weapons testing are gratified that recent world developments have greatly increased the prospects for an agreement on such limitation. The detailed report* of the Geneva Conference of Experts represents a major technical contribution to the problems of detecting nuclear explosions. With the report of the conference now available it is possible for scientists generally, and it is indeed their responsibility, to point out to the public the advantages, disadvantages, and pitfalls of the various possible forms of agreement which our government might make. In particular, we must face the dangers of an "absolute" test ban.

We propose that the FAS should specifically endorse an "operational" test ban agreement—an agreement under which the size limit of an explosion is defined unambiguously in terms of the response of the instruments used to detect the explosion. Our reasons are discussed below.

Background. The feasibility of detecting nuclear explosions has been studied by Technical Experts at Geneva. Their conclusions may be partially summarized, very briefly. Nuclear explosions underground can be fairly reliably detected at a level of energy release of 5 kilotons (5000 tons of TNT equivalent). Explosions in the lower atmosphere can be detected above 1 kiloton. Explosions above the atmosphere—above about 30 miles altitude—cannot be reliably detected at the present time.

Alternatives. The future agreement on the limitations of nuclear explosions would probably be one of the following types.

1. The "absolute" agreement. All nations involved would agree not to set off any nuclear explosions, regardless of whether they were of detectable size.
2. The "limit-of-detection" agreement. The agreement would ban all tests that could be detected by the surveillance network.
3. The "yield" agreement. All tests would be eliminated whose energy release (yield) was greater than a specified number of kilotons (TNT equivalent).
4. The "operational" agreement. All tests would be ruled out whose effects on the measuring instruments of the surveillance teams were more than certain agreed-upon values.

While any agreement on the banning of nuclear tests is bound to be difficult to administer, all these types of agreement except the last one have certain practical difficulties that must be reckoned with.

The "absolute" agreement suffers from the fact that secret tests of military significance might well be conducted by some nations. While some experts have debated the military significance of tests smaller than 5 kilotons, not all experts are agreed on this point. Furthermore, as long as the very-high-altitude tests are uncertain of any detection it must be granted that the absolute agreement is dangerous from a military point of view.

The "limit-of-detection" type of agreement is bound to suffer from surprises and disputes. The limits of detection are always uncertain, depending upon the presence of earthquakes, storms, winds, and depending even on the vigilance of the surveillance teams. Thus there would always be arguments among the nations as to whether a given explosion was in violation of the agreement.

The "yield" type of agreement suffers from the fact that almost any yield of explosion could go undetected if it were to occur far enough above the earth's atmosphere. Even with respect to underground tests, detonations of high yield might be concealed by elaborate cushioning.

The "operational" agreement would seem to offer the only means of avoiding conflict among nations on the administration of the agreement.

To be as specific as possible on the nature of an operational test ban agreement, let us outline a possible agreement as it is suggested by the report of the technical experts who met at Geneva. All nuclear explosions would be forbidden whose energy delivered into ground movement was greater than that of a 5 kiloton bomb exploded underground without any cushion around it. All tests would be forbidden whose atmospheric radioactivity was greater than that of—say—a 1 kiloton bomb exploded at ground level. Similarly, any test would be forbidden if it caused more than a certain energy in sound waves or more than a certain radio disturbance. Such an agreement would be as free as possible from ambiguity of interpretation, and completely fair to all participants. As long as they stayed below the limits defined in the agreement all nations (including the US) would be free—equally free—to carry out tests.

While one would hope that as the detection system is tested and improved the limits set by the agreement could be revised from time to time, it would be folly to ban any form of test that could not be detected with reliability—just as it would be futile to have a speed limit for automobiles if policemen had no speedometers.

The possibility of an absolute test ban has always been attractive because it has offered, seemingly, a solution to the Nth country problem—the complex situation that will arise when there is a large number of countries that possess nuclear weapons. Nevertheless we must reject the absolute ban in view of the military importance of the undetectable tests. Furthermore, an absolute ban might not be the best arrangement for relaxing tensions. Fear of clandestine testing by other countries might grow to the point of endangering the whole agreement.

To those who say that undetectable tests cannot be of military significance, we give three answers. Even megaton tests are at present undetectable at very great distances from the earth. Bombs in the range of 1 kiloton are essential to a modern army in the nuclear age. To rule out undetectable tests would encourage cheating, just as surely as prohibition encourages bootlegging.

To those of us who have been worried by the effects of fallout on the human race, the proposed operational form of agreement would be excellent, for the release of radioactivity into the atmosphere would be brought near zero.

The policy proposed here represents an amplification in detail of the general FAS position supporting bomb test limitations under an international system of inspection. The release of the Geneva Experts' report and the imminence of the Geneva five-power meeting call for the adoption by FAS of more specific views than in the past, and call for active endorsement by FAS of a practical plan.

*Text of experts' conclusions, New York Times, Sunday, August 31, 1958, page 2; or (in more detail) Electronic News, Vol. 3, No. 104, September 1, 1958, pp. 11-15.

IS A TEST BAN ENOUGH? (continued from page 5)

In my opinion, a reevaluation is needed of the wisdom of a bomb ban at this time. As matters now stand, I believe there is considerable justification in some form of "package" plan which will go beyond the question of weapon tests alone. What is needed is an international agreement which will ultimately neutralize all military missile capabilities. The question is, can we afford the risk of undertaking initial disarmament steps piecemeal and not include the missile problem from the outset. That the inclusion of missiles in initial disarmament proposals considerably complicates the picture both technically and politically is certainly clear. However, it also seems clear that there is much that warrants and justifies these added complications.

The current position, as announced by the Administration in connection with the political negotiations scheduled to start Oct. 31, calls for a test ban agreement only if accompanied by other disarmament measures. While it may be unlikely that missiles will be included in these talks, in my opinion, the existence of these devices requires that any initial agreement include more than just the test ban question if such an agreement is to constitute a significant disarmament step. Therefore, I urge that FAS develop new policy which will enable it to: 1. support the current position of the Administration and 2. press for an early realistic consideration of the question of missiles. In connection with the latter point, FAS should take the lead in advocating an international conference of technical experts to study ways and means of monitoring a military missile test ban and in addition FAS should intensify its own efforts in connection with such studies.

F. A. S. NEWSLETTER

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October 1, 1958

NEW PROBLEMS FACE GENEVA TALKS

The three major nuclear powers, England, the USA, and the USSR are scheduled to meet in Geneva on Oct. 31 to begin negotiations on an agreement for an international ban on nuclear weapons testing. The decision to convene this meeting came after the announcement of the findings at the technical talks in Geneva last August. The unanimous view of the experts was that it is feasible to monitor nuclear explosions with a world-wide network of control posts. The optimistic outlook augured by the agreement of the scientists from East and West participating in the technical discussions, is offset somewhat by several of the problems the political conference will have to face: the determination of France to produce and test its own nuclear weapons before agreeing to any world-wide ban; and the question of what the attitude of Communist China will be to the establishment of the necessary control points within its borders.

Scientists from eight nations on both sides of the Iron Curtain participated in the technical talks on policing bomb tests, and their final report represents one of the rare documents in which East and West concurred unanimously. The report lists as the methods for detecting nuclear explosions "... collecting samples of radioactive debris, ... recording seismic, acoustic and hydroacoustic waves, and the radio signal method ..." and states that these techniques along with "... on the site inspection of unidentified events ... make it possible to detect and identify nuclear explosions, including low yield explosions (1-5 kilotons)." Their conclusion is that "it is technically feasible to establish ... a workable and effective control system to detect violations of an agreement on the world-wide suspension of nuclear weapons tests." They recommended that the control system be under the guidance of an international organization. A total of about 180 control posts is recommended for world-wide coverage; 110 of these on continents, 60 on oceanic islands, and ten on ships. The continental control posts would be distributed as follows: North America-24; Europe-6; Asia-37; Australia-7; South America-16; Africa-16; Antarctica-4. The ground control posts would be supplemented by aircraft taking air samplings on north-south flights over the oceans near the continents to check for any radioactive debris. The experts pointed out that deep underground explosions might be hard to detect and that the schemes they propose do not include specific means to detect explosions at very high altitudes. However, it was pointed out in the report that the effectiveness of the various detection methods would increase in time as measuring techniques improved and as more data were obtained on interfering natural phenomena such as earthquakes and volcanic explosions.

U. S. Proposal

The proposal for starting test ban negotiations October 31 was issued by President Eisenhower the day after the above report was released. In his statement, the President noted that Soviet concurrence in the conclusion of the experts that nuclear policing was feasible implied a willingness on their part to accept the controls such a system would impose, and that this "opened up the prospect of progress in the vitally important field of disarmament." The statement further indicated the willingness on the part of the US to suspend nuclear weapons testing on a year-to-year basis beginning Oct. 31, provided that at the beginning of each year, "a) the agreed inspection system is installed and working effectively; and b) satisfactory progress is being made in reaching agreement on and implementing major and substantial arms control measures such as the United States has long sought."

(continued on page 4)

ATOMS FOR PEACE CONFERENCE

The second international Atoms for Peace Conference, held in Geneva Sept. 1-13, again demonstrated a common area of emphasis among scientists. Attention focused on hydrogen and its isotopes, rather than on uranium, which starred at the 1955 Geneva meeting.

The climax at the conference came even before it started, when in a joint statement Lewis L. Strauss and Sir John Cockcroft, heads of the US and British delegations, revealed that the two countries had declassified their research on attainment of controlled thermonuclear reactions. The Soviet scientists also stated that their work to date would be freely presented.

Russian scientist L. A. Artsimovich said that discussion of thermonuclear research on an international scale was more important "than that of the separate investigations, which as yet have not brought us very much nearer to our goal." (N. Y. T. 9-3-58). America's Edward Teller said "... it is wonderful that in this important area of research we can all talk together and work together freely ... I hope that this spirit will last ... and ... be extended."

Joint H-Power Research

Soviet delegates proposed unofficially that further development of thermonuclear research be carried out jointly by scientists from East and West. No positive reaction to this scheme was forthcoming from the US delegation. James R. Killian described it as "a matter requiring political determination which must be considered in Washington." (W. Post 9-12-58). Glenn Seaborg, US Nobel prize winner in chemistry, urged cooperation between US and Soviet laboratories on the creation and study of new elements. He said that elements with atomic numbers up to 110 may still be produced and identified.

The detailed discussion of thermonuclear developments by all participants tended to overshadow the specific results reported especially since no startling successes were claimed. The Russians showed a model of "Ogra," a 64-foot-long experimental fusion machine which dwarfs western devices in size, but which embodied no novel principles. In the technical papers, scientists from the US, Britain and the Soviet Union reported reaching temperatures of the order of one million degrees and more. A major advance in this field is still some time in the future.

Motion pictures of a 100 megawatt nuclear power station in Siberia suggested questions as to its mode of operation and date placed in service. But Russian scientists would give no details, and made no mention of the plant in technical talks. The reactor is larger than any previously reported operating in the Soviet Union, and is comparable in size with America's 60 megawatt Shippingport plant and the 100 megawatt Calder Hall breeder plant in England.

Radioactive Wastes Discussed

A puzzle in meson theory may have been resolved at Geneva with the announcement that direct decay of pi mesons into electrons has been observed by a team of physicists from CERN, the European Council for Nuclear Research.

Another session discussed disposal of radioactive waste. US delegates reported that 60 million gallons of radioactive waste are presently held in underground tanks built for \$65 million. In addition over 10,000 curies of radioactive waste have been dumped in the oceans. J. A. Lieberman of the AEC claimed that "what we have done is completely safe."

AEC Commissioner Willard F. Libby may well have summed up the hope of the conference in saying "that it is inconceivable that the world will ever revert to partitioned research in civilian scientific fields." (W. Post 9-8-58).

In this issue, the Newsletter is introducing a new feature—a signed, contributed article by a member of FAS. It is hoped that the publication of articles of this type in the future will permit the Newsletter to serve as a forum for the discussion of ideas by the membership.

SCIENTISTS' ONUS TO INFORM

By Walter E. Selove*

Throughout the past, the results of scientific work have been used in developing arms. Scientists have deeply regretted such use of their training and abilities. But in the world we have lived in it has not been possible to eliminate war, and so practical realities have forced scientists, along with other men, to work for the defense of their nations and their families.

Now, however, there is no longer any hope of protecting one's family or country by the old methods of war. In the world we must live in from now on, it may still be possible to inflict destruction on an opponent, but it is almost certain that a nation will never again be able to protect itself or its people from destruction.

This does not mean there is no hope for the world. In fact, the advances of science, if turned more to use for man's welfare, can increase almost beyond bound the well being, health, and prosperity of all people.

Before this end can be achieved, however, a large scale educational job must be accomplished. Until the people, and their governmental representatives, understand, in their bones, the danger and futility of relying any longer on military force, we will all find ourselves repeatedly brought to teeter on the edge of annihilation.

These things have all been said before. But scientists have a special responsibility. Scientists, because of their special knowledge, are more acutely aware of the dangers and promises of science than the peoples of the world and their heads of government. Moreover only the factual analyses of science can finally bring the people and governments to understand the danger of relying on defensive weapons, the danger of the world's old way of doing business, and the potentialities for peaceful prosperous development of the world. Scientists everywhere have a responsibility to contribute to the education of their peoples and their governments on these matters.

One matter, which should be undertaken urgently by scientists throughout the world, is to supply the analyses needed to assure their citizenry that in a nuclear war "victory" and "surrender" are meaningless terms. It would be best, for instance, if such a study were made and released by our Government. The President's Science Advisory Committee could be expected to make impartial studies of defensive possibilities, but even if it did so, one suspects that reports giving a gloomy outlook for defense would not be widely publicized by the Administration.

There is therefore a burden on non-government-connected scientists to carry out studies which would indicate the possibilities, or lack of possibility, of defense against intensive attack. There is a simultaneous responsibility to educate the public, and the government leaders, to understand the illusory nature of defensive measures. With modern methods of mass destruction, only a 100 per cent defense can prevent annihilation, and 100 per cent defense can never be expected, especially in the first stage of an intensive attack.

*Walter E. Selove is Associate Professor of Physics at the U. of Pennsylvania and is the current Vice-Chairman of FAS.

CHAPTER NEWS

The Cleveland Chapter's Conference on Science and Survival (June 7) was very successful, with over 350 people attending. About 250 were interested enough to fill in a rather long evaluation form, with the overwhelming majority of comments favorable, and indicating support for another conference to be held October 12. Although FAS members took the initiative in sponsoring the Conference, it was the support and encouragement from ten local civic and church organizations which made the Conference successful. Press, radio and TV publicity was highly favorable and abundant.

The Cleveland Chapter has also recently formed a Speaker's Bureau with seven speakers and twenty-eight topics. Several talks have already been given in church and business groups, and the speakers report great interest in their subjects.

BABY TEETH OR FALLOUT

Any discussion concerning radiation hazards is hampered by the fact that scientists are still abysmally ignorant about the long term effects of radiation.

The dose of radiation that man can tolerate with impunity is still being argued. Two thoughtful summaries of the current status of the problem, as seen from the statistical and biological points of view, have recently appeared. In articles by A. W. Kimball (*J. Nat., Cancer Inst.* 21, 383, 1958) and Austin Brues (*Science* 128, 693, Sept. 26, 1958) it has been pointed out that it is not yet possible to determine a clearcut dose-response relationship between radiation and the incidence of leukemia. There is a considerable amount of dose-response data for the production of leukemia in experimental animals which, unfortunately, is not directly applicable to man because the appropriate scaling factors are not known.

Although measurement of radioactive fall-out by various methods and in all parts of the world provides an estimate of the potential exposure of the population to radioactivity from such elements as Sr-90 and Ce-137, this type of data collection affords no direct means of measuring the effects of such fallout on man.

A unique method for estimating the uptake of strontium-90 and cesium 137 in man was proposed by Herman Kalckar, Professor of Biology, Johns Hopkins University. In an article entitled "An international milk teeth radiation census" (*Nature* Vol. 182, Aug. 2, 1958), Dr. Kalckar suggests that a large scale collection of children's milk teeth and the measurement of radioactive Sr-90 and Ce-137 contained therein would provide important data on the distribution of radioactivity throughout the world. It is known that these elements are actively taken up and deposited in the bones and teeth of children. The actual amount of radioactivity would reflect the environment and eating habits of the populations studied.

For example, it would be anticipated that where soy beans are a staple of the diet a low level of radioactivity would occur in children's teeth while the teeth of children drinking milk would have a high level of radiation. Such data would be of more significance than measurements of Sr-90 deposited as fallout.

U. S. LIMITS RUSSIANS' TOUR

Six Russian Scientists, in the U. S. for ten days to take part in the annual meeting of the Instrument Society of America in Philadelphia, requested three week visa extensions in order to tour US industrial plants and schools. The State Department denied their requests on the basis of a policy of restricted travel for Russians in this country; a policy maintained because US citizens are not allowed free travel in the USSR. This information was noted by the *Wall Street Journal* which pointed out, in a September 18 editorial, that such travel restrictions may be expected in a police state like the USSR but not in the USA.

The editorial also suggested that an informative tour of campuses and industrial plants by this Russian group need not include visits to areas involved in secret defense work like Cape Canaveral. The *Journal* emphasized that the six scientists might go home with a better understanding of America, her aims and achievements, if they were permitted to travel about.

The editorial concluded: "And Mr. Dulles, every now and then, remarks sadly that the Russian people don't seem to understand what the US is really trying to do. Sometimes, every now and then, we don't either."

SURPRISE ATTACK

This summer's conference of East-West technical experts on detection of nuclear explosions, which is to be followed starting Oct. 31 by a meeting of US, British and Soviet political representatives, may have set a needed pattern of exploring "... questions of scientific possibility before turning to questions of political reality" (*Science*, Editorial 9-12). At any rate, on Sept. 15, after US prodding, the Kremlin accepted President Eisenhower's April 28 proposal that specialists meet in Geneva to consider ways of preventing surprise attack. Although the US specifically disavowed any commitment to be bound by the results of the conference, and although the conference would involve all the knotty problems of previous disarmament talks (open skies, etc.), the Soviets clearly indicated that they hoped that it would lead to an eventual summit meeting on the subject. The Russians proposed that the technical talks start Nov. 10 and should last four to five weeks.

BOOK REVIEWS

No More War by Linus Pauling, Dodd, Mead and Co.
209 pages, Price \$3.50

The Arms Race by Philip Noel-Baker, Oceana Publication,
562 pages, Price \$6.00

Inspection for Disarmament by Seymour Melman, Columbia
Univ. Press, 291 pages, Price \$6.00

If these three books about the arms race were put together into the cornerstone of a building they might provide, centuries hence, a good deal of detail on what happened to us. For the same reason these three books can be recommended to those who now are wondering if our cornerstones will be here centuries hence. The books are soundly put together and will likely command respect even from those who disagree with them.

Pauling and Fallout

As the title indicates, Dr. Pauling's book, the only one of these three written entirely by a scientist, has a more hortatory and emotional tone than the others. Its opening sentence is: "I believe that there will never again be a great world war, if only the people of the United States and the rest of the world can be informed in time about the present world situation." This is reminiscent of Dr. Oppenheimer's view that the new weapons will absolutely end war, the "only" question being whether they will end war in our time, or after a few more catastrophes.

A greater part of the Pauling book is devoted to fall-out. Pauling views, when set out at some length, are not so radical as his opponents have pictured them. For example, he asks a question about fall-out production of leukemia, bone cancer and other diseases in this generation: Will this happen to hundreds of thousands of people? He replies: "nobody can answer this question with certainty, at the present time." He goes on to say that he would answer "yes," but that some scientists with competency think that it probably should be answered "no." Dr. Pauling undertakes a detailed rebuttal of statements and implications of the AEC. Many scientists will agree with his criticism of some of the statistics and conclusions of Edward Teller.

Dr. Pauling also proposes an idea similar to one which is currently gaining support in Washington. He says, "It is proposed that the great world problems be solved in the way that other problems are now solved—by working hard to find their solution—by carrying on research for peace. It is proposed that there be set up a great research organization, the World Peace Research Organization, within the structure of the United Nations. This organization should include many scientists, representing all fields of science, and many other specialists, in all fields of knowledge. They would attack world problems by imaginative and original methods, and would work steadily in this attack, year after year.

Workable Inspection and Disarmament

The Melman book is an example of one kind of study such an Academy might do. It is based entirely on papers prepared for the Institute of War and Peace Studies at Columbia University from a project "to define the necessary conditions for a workable inspection system of disarmament control." As most newspaper readers know, the project found that inspection would be feasible with a reasonable expenditure of manpower and money. Since then, at the Geneva meeting, US and Russian physicists have agreed that inspection is workable. This book remains valuable for its abundance of data and its mixture of cold realism and ingenuity in meeting problems of the technology of disarmament. Most physicists who have read it agree that this is the best thing of its kind—at least in the unclassified literature—since the Lilienthal-Oppenheimer study of 1946.

Noel-Baker is a British diplomat with a lifetime interest in disarmament. He subtitles his book "A Programme for Disarmament," but 90 percent of it is devoted to facts, or to the ultimate conclusions of the best military, scientific and diplomatic minds of today. This is a large, thorough and scholarly review of everything a citizen—or a Senator—might want to know about the fix the human race is in. Noel-Baker is as thorough and as lucid as P. M. S. Blackett and (in this reviewer's judgment) a great deal more fair. His book also deals with inspections of various kinds of weapons.

These three books belong with the Kissinger, Kennan and Oppenheimer books, and with your daily newspaper—on the basement bookshelf next to the emergency supplies. Noel-Baker's book in particular can be recommended to all who still keep their fingers crossed; who still hope that by taking thought man can add years to his life, and give civilization to his children.

Michael Amrine

FINAL FORM OF EDUCATION BILL

The National Defense Education Act of 1958, better known as the Aid to Education bill, was signed into law on Sept. 2, 1958 by President Eisenhower. State school systems will participate in a four year program, for which 900 million dollars have been authorized. State governments will share the cost with the Federal government. Each state must submit plans in order to obtain its share of the allocated funds.

Federal support will be given in various forms: (1) Loans will be granted to college students, to a total of 295 million dollars, to be repaid with interest. However, only half of the amount of the loan is to be repaid by students who teach for 5 years. Preference in the awarding of loans will be given to (a) students with superior academic backgrounds who wish to become teachers, and (b) students who are superior in science, mathematics, engineering or a modern foreign language. No special mention of the social sciences was made.

(2) Funds totaling \$60 million have been authorized for vocational training.

Scholarships Omitted

(3) 5500 National Defense fellowships will be awarded for study in graduate programs, preferably to prospective teachers. No undergraduate scholarships have been included although Eisenhower originally asked for 10,000 scholarships.

(4) 280 million dollars have been earmarked for scientific instruction equipment in elementary and secondary schools. No funds have been authorized for salary increases for the teachers who will use the equipment.

(5) Authorized funds for guidance, counselling and testing amount to \$60 million.

(6) An additional \$18 million has been allocated for research and experimentation in educational television, radio and movies, and \$200,000 has been set aside for improvement of statistical services of state educational agencies. However, no funds for school construction have been provided.

Arthur S. Flemming, Secretary of the Department of HEW, discussed the bill on Sept. 10. He indicated that colleges are expected to begin awarding Government-supported loans by January 1959 and that some graduate fellowships are expected to be granted by Feb. 1959. Although Flemming said that "this act provides us with the first opportunity this country has ever had to strengthen some of the obvious soft spots in education," he criticized the bill by remarking that "the loan program won't bring in the type of competitive student that the scholarship program would have brought in." The Secretary indicated that he would ask the next Congress to reinstate the scholarship program.

The FAS is a national organization of scientists and engineers concerned with the impact of science on national and world affairs. The Newsletter is prepared in Washington by FAS members. The staff for this issue included, Editors: M. Elkind, E. Shelton and M. Singer. Writers: J. Buck, H. DuBuy, G. Picus and E. Shelton. Production: I. Shapiro, of the Washington Office Staff.

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GENEVA TALKS (continued from page 1)

Although the negotiation proposal was finally accepted by the Soviet Union, Khrushchev took the propaganda advantage offered by the two conditions imposed by Eisenhower on continuation of a test ban, to accuse the US and Great Britain of "... proceeding with their old policy of evading ... under various pretexts ... a commitment to stop the tests of nuclear weapons instantly." Khrushchev was able to point to further evidence of what he termed insincerity on the part of the West with regard to bomb test suspension, in that the US continued its Hardtack series of tests in the Pacific until Sept. 8, two weeks after the issuance of the Eisenhower proposal, and then announced there would be ten "low-yield nuclear detonations" at the Nevada proving grounds before the Oct. 31 deadline. Great Britain also continued tests of high-yield nuclear weapons in September. Although accepting the proposal to start negotiations Khrushchev rejected the conditions laid down in the American statement, and announced at the same time that the current tests of the governments of the US and Great Britain relieved the USSR of its unilateral commitment to suspend its weapons tests, immediately after the USSR had completed a series of tests of its own last March 31.

The announcement on Sept. 30 that the Russians had conducted some additional tests above the Arctic circle has been interpreted by the State Dept. as indicating that their now defunct moratorium was purely a propaganda move. It remains to be seen whether or not the Russian rejection of the US conditions for maintaining its own test suspension from year to year — as well as other world tensions — will preclude productive agreements at the East-West conference still scheduled for Oct. 31.

The USSR proposed on Oct. 1, that the Geneva talks be put on the foreign minister level. It had been expected the talks would be among the lesser envoys on disarmament and the possibility arose that the new Soviet proposal would put a premium on time for the ministers to prepare and attend such a meeting. It was also feared that the propaganda aspect of such a conference might detract from progress on disarmament.

FAS Statement

Elimination of the test series planned for the Nevada proving grounds was urged by FAS in an open letter from the Executive Committee to President Eisenhower (N.Y. Times & Wash. Post 9-14). Planning additionally (N.Y. Times shortly before the opening of the test ban negotiations on Oct. 31 "casts considerable doubt on our sincerity in desiring a workable test ban agreement," wrote the Executive Committee. Stopping the proposed Nevada series of tests "would assure all concerned of our true desire to take steps aimed at achieving a stable world peace." In view of the Russians' renewed testing, further consideration of our low yield tests at Nevada appears academic. However it is clear that the President overlooked a unique propaganda move which would have resulted from his renouncing the previously announced Nevada tests.

FAS NEWSLETTER

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France and China?

Even should the three major powers negotiate a workable nuclear test suspension and inspection agreement, the world will still be faced with the problem of bringing into line the "Fourth Powers", those countries sufficiently advanced technologically that they are on the verge of producing their own nuclear weapons. This problem is epitomized by France, which has announced that it intends to go ahead with its plans to develop and test nuclear weapons of its own. The French Foreign Ministry, in an official statement, maintained that a mere suspension of tests does not lessen the possibility of nuclear war unless agreement is also reached to destroy existing stockpiles of nuclear weapons and the production of new weapons is stopped. France must therefore maintain its program to gain membership in the "Atomic Club".

A second problem in developing a workable test inspection system arises from the unknown position that Communist China will take concerning the establishment of control and inspection posts within its territory. Communist China has just been denied UN membership again primarily as a result of the insistence of the US. In addition, the current powder-keg conditions of the Formosa Straits makes it appear quite unlikely than an atmosphere of reason and temperance will soon prevail in Red China's relations with Western powers.

RIGHTS RESTRAINTS DIE IN CONGRESS

Congress went home without enacting hotly debated proposals to restrict foreign travel, to give agency heads free-wheeling power to fire employees on security grounds, and to curb the Supreme Court.

The Vorys-Selden bill, an 11th hour House effort to authorize the State Dept. to deny passports to persons who have knowingly furthered Communism, died for lack of Senate action. The State Dept. refused to support this measure since it required the Dept. to disclose sources of information used in denying passports. The bill was designed to overturn the Supreme Court's Kent, Briehl and Dayton decisions of June 16 which held that under present law passports cannot be denied on the basis of beliefs and associations only, unaccompanied by overt and proven law breaking.

The Senate also failed to support the House Walter bill giving Federal agency chiefs full power, until June 30, 1959, to suspend and fire any Federal employee for security reasons. The Walter bill sought to upset the Court's Cole vs. Young decision that present law covers only those employees in sensitive positions.

Congress also let die other legislative proposals aimed at curtailing the Court's power in civil rights areas (FAS Newsletter, Aug. 1958). The Court was under severe attack throughout the last session, and its jurisdiction was reserved in fact only by the determined efforts of Senators Lyndon Johnson, Douglas, Humphrey, Morse, Hennings and Cooper.

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