

# F. A. S. NEWSLETTER

Published by the  
FEDERATION OF AMERICAN SCIENTISTS  
1805 H Street, N. W., Washington 6, D. C.  
Augustus H. Fox, Chairman

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

No. 59-1

January 15, 1959

## OUTER SPACE RACE

The race into space between the US and the USSR began just about 15 months ago with the Russians' announcement of the successful launching of Sputnik I. This accomplishment had tremendous psychological and propaganda impact. It precipitated a storm of criticism and debate in the US and spurred all agencies of the government associated with missile development to greater effort. Through most of 1958, the contest between the US and Russia has resembled that of a fast lightweight boxer versus a slow heavyweight puncher. In 1958, the US launched four small satellites and two moon probe rockets that were nearly successful in reaching the moon. The USSR launched only two more satellites after Sputnik I, but each had an impressively heavy payload. (Sputnik III had an instrumental payload of over 2000 pounds). The Russians clearly demonstrated that their rockets possessed a thrust capacity substantially greater than those of the US.

On Dec. 18, 1958, the US stepped into the light heavyweight class with its successful launching of the Atlas I satellite (weight, 8700 pounds, with an instrument payload of 167 pounds). This success gave a great psychological boost to the US in the missile race. The feeling was growing that the US was beginning to pull abreast of Russia.

### Lunik Steals The Show

This optimistic feeling lasted but two weeks, that is, until the announcement came from Moscow Radio: "On Jan. 2, 1959 a cosmic rocket was launched toward the moon in the USSR . . . the launching . . . again demonstrates to the world the outstanding achievement of Soviet science and technology." (NYT, 1/4). Despite the fact that the USSR did not reveal how close the orbit of "Lunik" was to the orbit that was planned, this was an impressive achievement. President Eisenhower issued a statement calling the Russian achievement "a great stride forward in man's advance into the infinite reaches of outer space" (NYT, 1/4). The Russians once again had demonstrated their ability to develop enormous rocket thrust by putting such a heavy vehicle into space. The last stage of this rocket weighed 3250 pounds, with an instrument payload of 800 pounds. If a fair fraction of these instruments worked successfully, the scientific information gathered from this single shot should be substantial.

Since the thrust and accuracy of the guidance control system necessary for the success of Lunik were of the same order of magnitude as that already displayed by the Russians in the launching of Sputnik III, the added military significance of the latest Russian venture into space was not considered to be great. However, once again the propaganda and psychological triumph was enormous.

About 18 months ago, Soviet Ambassador Menshikov arrived in the US aboard the then much heralded Russian jet airliner, the TU-104. On Jan. 2, Soviet Vice Premier Mikoyan arrived in the US, as it were, via a rocket to the moon. Anticipating that the Russians may continue to couple unique propaganda feats with their scientific innovations, unlimited imagination is required to envisage the mode of transportation to be used if Premier Khrushchev ever visits the US.

### US Space Status Evaluated

From the scientific point of view this race into space is an inspiring game whose long range results, no matter which nation "wins," will be beneficial to all mankind. However this game takes on a somber aspect indeed when its impact on military technology is considered. In the report entitled "The United States and Outer Space" issued on Jan. 10,

(continued on page 4)

## KILLIAN SETS SCIENCE OBJECTIVES

In giving the annual Sigma Xi—Phi Beta Kappa lecture on Dec. 30 during the Christmas meeting of the AAAS in Washington, D. C., Dr. James R. Killian Jr. set forth the following objectives for federal science policy:

"To enhance the excellence of our science, both basic and applied, and to add to our effort, relatively, in basic research;

To extend the recognition of science as a creative activity that augments man's dignity and understanding and affords him intellectual adventure of the highest order;

To recognize that outstanding accomplishments in science appeal deeply to the hopes and aspirations of men everywhere, and contribute to the prestige and goodwill of nations;

To demonstrate that the democratic environment of the free world is the best environment for achievement in science;

To improve the ways in which our government uses and supports science;

To apply it [science] more effectively to improve our environment, to strengthen our economy, to improve the health and welfare of our citizens and the peoples of the Free World;

To promote international understanding and goodwill;

To insure that science and technology contribute their maximum to the defense of the United States and the Free World."

He went on to survey the record of our government's progress in the administration of science during the past year, pointing among other items to the near tripling of the NSF budget primarily for basic research and training, the establishment of a civilian National Aeronautics and Space Administration, the passage of the National Defense Education Act, the participation of the US in the IGY and the second Atoms for Peace Conference, the reestablishment of the Office of Science Adviser in the State Department, and the revitalization of the scientific attack program.

Dr. Killian placed particular emphasis on the emergence of a new role for the nation's scientists; that of advisers at the highest policy making levels in government. He said that the President's Science Advisory Committee, made up largely of scientists outside the government, serves as an established means of communicating the ideas of the scientific community to the federal government.

### Council For Science

Dr. Killian discussed the contents of a report by the President's Committee, which he heads, recommending the establishment of a Federal Council for Science and Technology. The President released the report several days earlier, stating that he had already taken steps to form the Council. The Council will be made up of representatives from policy-making levels of the existing governmental agencies having substantial research activities.

The committee opposed the incorporation of all the scientific activities of the government under a single department headed by a secretary of cabinet rank, pointing out that most of these activities are directly related to the missions of the existing departments. Agencies such as the NSF, AEC, and NASA, the Committee held, have unique purposes which would not be aided by administrative amalgamation.

The new federal council will coordinate efforts in science and technology, while the President's Science Advisory Committee will retain its advisory functions. The Council will be concerned with research carried out in government labora-

(continued on page 4)

## FALLOUT HAZARDS HASSLE CONTINUES

The great debate, between a number of scientists on one hand, and the Atomic Energy Commission and US Public Health Service on the other hand, over the hazards of nuclear tests is continuing. Of late, the principal spokesmen have come to be Dr. Linus Pauling on one side, and AEC Commissioner Willard Libby on the other. Many commentators on this running fight have reached the conclusion that both sides are simply drawing different conclusions from the same facts.

Dr. Pauling (NYT, 4/29 & 5/16, Science 11/14) has analyzed published data on the effects of carbon-14 and estimates that one year of testing (30 megatons of fission and fusion) will ultimately cause 600,000 deaths or gross defects to children and unborn children. In addition, Dr. Pauling believes the somatic effects of carbon-14 equal or exceed those of fission products, including strontium-90. These same figures, when spread over the 8000 year mean lifetime of carbon-14 look considerably less terrifying. It is this difference in emphasis—total deaths versus their rate—that has aroused such strong arguments between the “look-with-alarm” and the “everything-is-rosy” camps.

All public reports by the AEC and the PHS emphasize that levels of strontium-90 in milk are well below the levels set by the National Committee on Radiation Protection and Measurement. These levels appear to have hit a high in July, when the strontium-90 content of milk in St. Louis exceeded 18 micro-microcuries per liter. The maximum level set by the NCRP&M is 80 micromicrocuries per liter. In this connection, experiments by Dr. Libby showed that potassium used in fertilizers can reduce the uptake of strontium-90 by plants. The experiments, carried out at the Geophysical Laboratory at the Carnegie Institution in Dr. Libby's spare time, indicated that 30 pounds of potassium per acre would reduce the radio-strontium uptake by about 40 per cent (NYT, 11/8).

Because of the high level of strontium-90 in milk from the St. Louis area, the Greater St. Louis Citizen's Committee for Nuclear Information has decided to collect baby teeth in order to provide a record of the absorption of strontium-90 by the children of the area (Wash. Post, 12/23). The use of baby (or milk) teeth for this purpose was first proposed by Dr. Herman Kalckar (see NL 58-7).

### Accidents In The News

Like any other enterprise, the nuclear programs of the world lead to unpleasant accidents. Thus six Yugoslav atomic scientists were sent to the Curie Hospital in Paris last November for treatment after receiving a large overdose of radiation. Four of them are reported doing well after receiving bone marrow grafts (NYT, 1/11). The most severely injured of the six died, but the status of the other scientist is not clear from news reports.

In the United States, an accident at Los Alamos resulted in the death of Cecil W. Kelley, a laboratory technician, whose fatal radiation burns occurred in a lab accident. He was the third person to die of radiation at this lab in 13 years. In another US incident in November, 1500 acres of the large AEC site at Idaho Falls were contaminated during tests for a nuclear aircraft engine. There were no casualties.

### FALLOUT SUITS SEEK TEST BAN

Lawsuits which seek to stop governments from testing nuclear weapons are working their way slowly through the courts of the United States and the Soviet Union. Two suits, on behalf of a total of 39 plaintiffs including Norman Thomas and Linus Pauling, were filed in each country in the spring of 1958, and similar action is contemplated in Britain and France. The suits contend that tests are illegal, violate due process of law and the human rights provision of the UN Charter, infringe on freedom of the high seas, and violate the UN Trusteeship agreement for the Trust Territory of the Pacific Islands.

In the USA, the first suit was dismissed, on the government's motion, by Federal District Court Judge Keech on July 31, 1958 and is now awaiting a place on the Court of Appeals calendar. The government maintained that the tests were in the public interest, and were carried out under authority not subject to judicial review. The suits have not yet been tried in Russia, but attempts to obtain visas for attorneys are under way.

An organization called The Fallout Suits, 122 North Hudson Avenue, Pasadena, California is seeking support for the expenses of the lawsuits.

## PEACEFUL USES OF ATOMIC ENERGY

Despite President Eisenhower's strictures regarding “reckless spending,” Senate Majority Leader Lyndon Johnson has included the development of the peaceful uses of the atom with emphasis on an atomic merchant marine, in his 12-point program for the new Congress. Congressional atomic energy experts have also expressed approval of increased governmental assistance for A-power programs. According to the *Washington Post* (12/2), the Democratic majority of the Joint Atomic Energy Committee presumably still supports the recommendations advanced last June by then Chairman Durham (D, N. C.) and Sen. Anderson (D, N. M.)—that one million kilowatts worth of new-type atomic plants, costing \$875 million, be constructed over the next 5-7 years. More recently, both Senators have claimed industry support for a speed-up in the US civilian power program and have cited answers to a Joint Committee questionnaire as an endorsement of their proposals.

### A-Plant Development

Late last November the Philadelphia Elec. Co. combined with more than 50 other private utilities in a newly organized non-profit group and offered to build a \$24.5 million, 30-40,000 kw. nuclear power plant near Philadelphia (Wash. Post 11/22). The private sponsors expect the Government to contribute \$14.5 million to the project—a pioneer gas-cooled type reactor—completion of which is expected in 1962 or early 1963. The total estimated cost is \$39 million. This project was submitted to the AEC just before the expiration of a 60 day deadline fixed by Congress which would have required the AEC to build and operate the plant if no private group had come forth with a proposal.

In a separate action, the AEC announced in December that the Penna. Power and Light Co. and the Westinghouse Elec. Corp. had withdrawn their proposal to build a \$108 million homogeneous type reactor nuclear power plant. In abandoning this project, the two firms, which had already invested \$9 million in the undertaking, cited the “technical unfeasibility” of proceeding with the power plant before further research and development, including the construction of a small prototype plant, had been completed. Sen. Anderson, long an advocate of greater federal activity in the reactor development field, viewed this latest development as a demonstration of “the fallacy of expecting private industry to provide technical direction and financing for construction . . .” of new type reactors (Wash. Post 12/16).

### SCIENCE ATTACHES APPOINTED

In mid-December the State Department announced the appointment of three physicists, three chemists, and a zoologist to two-year terms as scientific attaches in the American embassies at Paris, Bonn, London, Rome, Stockholm and Tokyo (NYT, 12/14). Still to be appointed are science officers for Moscow, New Delhi and one of the South American capitals, probably Rio de Janeiro. There will also be Deputy Science Officers in all nine embassies, serving similar but overlapping terms (Science, 12/19). This program is a sputnik-sparked reactivation of one initiated in 1951 by Dean Acheson at the suggestion of a committee headed by Lloyd Berkner. Under the Eisenhower administration the original program was allowed to lapse in spite of protests and warnings by FAS and other groups.

Scientific attache appointments were made by the Science Adviser's Office of the State Department, which is headed by physicist Wallace R. Brode. The appointees have had experience as teachers, researchers, and administrators, are acquainted with scientists in the countries to which they will go, and each knows the language of the country to which he is assigned. Their duties will include advising the State Dept. of scientific factors that need to be taken into account in decisions affecting foreign policy and facilitating contact between foreign and American scientists. They will be expected to keep abreast of developments in neighboring countries as well as in the countries to which they are assigned. The Science Adviser's post itself was filled only a year ago by the appointment of Brode, after the position had been vacant since mid-1953. Furthermore, according to the *Wash. Post* (Edit. 12/21), Brode's efforts get the attache program moving have “been badly hampered by security procedures and other departmental delays.” Though the permanently-staffed Washington office is expected to add stability, *Science* (12/19) regards the short terms of the attache appointments as a point of vulnerability of the program “when political winds blow cold.”

### BOOK REVIEWS

#### SCIENCE AND EDUCATION AT THE CROSSROADS.

A view from the laboratory by Joseph W. Still, M.D.  
Public Affairs Press, Wash., D. C. \$3.75, 140 pages, 1958.

This book, written by an FAS member, is truly in the spirit of the goals of FAS. In it, the impact of science on society is studied to determine how man's knowledge and intelligence can help to decide the main question of mankind; will there be One World or None?

The task which the author has undertaken is an enormous one, as the following quotations from the book indicate.

"In recent years, science has often been accused of causing the great problems that have come with excess goods, leisure and people. These accusations are usually coupled with a challenge that science do something to solve the problem it has created." . . . "I do not only accept the charge that science is responsible, but I also accept the demand that science do something to solve these problems." The book is divided into two parts: The first discusses the short range problems of science and education, the second considers the long range problems of how best to use our scientific and industrial strength in order to achieve a lasting world peace. Obviously, the writer could only present the general outlines of the problems, and the direction in which their solution might be found. Also, in order to reach the widest possible audience, he had to use metaphors and phrases which might bother the specialist. As a consequence, the book can easily be understood by the non-specialist.

The author starts with an analysis of the aims of education in a technically advanced society, and the changes which should be made in our present approach to attain those aims. He then discusses the necessity of science representation in the Executive branch of Government by appointment of one or more Secretaries of Science without portfolio. Not that the opinion of scientists should settle every issue, but the effect of scientific developments on society is such that scientists should be placed in positions "which carry sufficient authority and prestige to adequately represent science in the formulation of high policy". One of the decisions to be made, he says, should concern the establishment of a national minimal standard of education, since about 27% of all high school graduates, 25 to 34 years old, have been interstate migrants at least once.

The first part of the book ends with an analysis of the manner in which basic research is supported, and an examination of the dissemination of scientific knowledge. These latter sections can be read with profit by specialists in the particular areas which are covered.

The second part of the book, the long-range view, presents broad arguments in favor of economic foreign aid given in terms of scientific education of the peoples of the world. As an example of what could be done, the writer analyzes, in an absorbing manner, the global effects of the use of DDT: the change in death rate, the increase in vigor of technically underdeveloped people, and the effect on the problem of birth control.

H. G. du Buy

#### SCIENCE IN RED CHINA

Little information concerning the progress of science and technology in Red China is available to the American public. Recently the Canadian geophysicist, J. Tuzo Wilson, who is President of the International Union of Geodesy and Geophysics (IUGG) toured Red China and made an excellent report of his travels in the Saturday Review (11/8). The purpose of Wilson's visit to Communist China was to obtain the cooperation of that nation's scientists in the IUGG, since China is the only major nation not represented in the Union. Wilson describes the current progress of China's plans for large, new, laboratory facilities, not only in Peking, but also in Lanchow, in the interior of China. The completed buildings are well equipped, and long-range plans include working space for tens of thousands of scientists and technicians. An immediate aim of these activities is to train scientists and this is reflected in the large percentage of advanced students enrolled in scientific courses. Large libraries are being built and Wilson found these stocked with current Western and Russian scientific journals. It is expected that the government policy to unify the spoken language of the Chinese people will eventually allow ready dissemination of

(continued on page 4)

### NEW HITCH IN GENEVA TALKS

When the White House released a statement on Jan. 5, questioning on the basis of new data, the reliability of the monitoring system for nuclear test detection devised at Geneva last summer, doubts were immediately expressed about the advisability of this country's agreeing to an unlimited test ban at the conference now in progress in Geneva. The test ban talks were progressing, several articles already having been agreed to by both sides, and a cautious optimism was beginning to develop in the commentary of the press. However, fear that we may now be much less willing to reach an accord, as well as that the Soviet's may find in this new data a reason, valid or not, for refusing to agree to a ban, has led to a dispersal of this optimism.

The statement, prepared by the President's Science Advisory Committee with the concurrence of the State and Defense Departments and the AEC said, in effect, that US seismologists have concluded that it is more more difficult to differentiate between small yield atomic explosions and earth tremors than had been thought at the time of the talks in Geneva last summer. The measurements made, during the October test series are apparently the basis for the skepticism.

The US delegate communicated the new information to a special session of the test ban conference on Jan. 5 but it created no very obvious stir there. The suggestion that experts discuss the new finding was met coldly by the Soviet delegation, which took the attitude that such questions should be taken up, if necessary, by the international control commission that will be established when an East-West agreement is concluded.

In this country, however, the White House release brought forth a number of statements and editorials both for and against agreement. The FAS issued a statement (Jan. 7) indicating its hope that this new information would not stop the US from reaching an accord.

#### Closed JAEC Hearings

The Joint Atomic Energy Committee held closed hearings Jan. 13 and 14, to hear testimony by Hans Bethe, Edward Teller, Dr. Carl Romney, chairman of the ad hoc panel of seismologists which originated the report, and others. No official statement was released. However, Dr. Bethe, in a news conference (Wash. Post 1/14) said that he believed improvement in seismological detection methods would make it possible to identify small underground tests as was previously believed to be possible.

Secretary Dulles, speaking to newsmen on this question (Wash. Post 1/14) indicated two areas still in doubt: 1) whether fairly large nuclear explosions can be distinguished

(continued on page 4)

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, H. Goldfine, Lee Herzenberg, Len Herzenberg and M. Singer; Writers, J. Buck, R. Hendler, Lee Herzenberg, Len Herzenberg, D. Melnick, T. Osgood, M. Singer, G. Snow and F. Stern; Production: I. Shapiro, of the Washington Office Staff.

- MEMBERSHIP APPLICATION—Dues: Regular—\$7.50 (with income below \$4500-\$4); Supporting—\$10; Patron—\$25. New membership and an introductory subscription to Bulletin of the Atomic Scientists—\$11.00 (with income below \$4500-\$7.50).
- SUBSCRIPTION TO INFORMATION BULLETINS—\$10 to individuals; \$25 for Societies, etc. (including Newsletter)
- NEWSLETTER SUBSCRIPTION—\$2 to non-members (all members receive the Newsletter)

Name .....

Mailing Address .....

Check enclosed  Send bill

MAIL TO: FAS, 1805 H Street, N. W., Washington 6, D. C.

Not For Release

1805 H St., N. W., Washington 6, D. C., January 15, 1959

## FAS COUNCIL TO MEET

The Winter 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, Jan. 31st starting at 2 PM. This is an open meeting, as are all FAS meetings, and all members who can possibly do so are urged to attend as observers.

### REPORT OF NOVEMBER COUNCIL MEETING

The regular fall meeting of the FAS Council was held at the Columbia University Men's Faculty Club on Nov. 22, 1958. In attendance were 20 delegates and alternates and 9 observers.

#### I. Public Policy Discussions and Decisions

a. Nuclear Testing and Disarmament—A suggestion was made by a group at Berkeley to modify the FAS position on nuclear weapons testing to push for a limited ban rather than an absolute one. This group asked the Council to adopt a position supporting an "operational" test ban which would prohibit all explosions which could be detected by an agreed upon surveillance network. Discussion brought out that for tests of one kiloton or more, whether above or below ground, the probability of detection is close to unity, while the probability of detection of smaller tests is less. Thus, depending upon the thoroughness with which seismological signals are followed up by on-the-spot investigations, nearly all tests above one kiloton and many below one kiloton can be detected by the kind of control network envisioned by the Geneva conference of experts. Although techniques for concealing explosions will improve, so will the methods of detection. The Council decided to maintain the FAS position of favoring an absolute ban on nuclear weapons testing.

The question then arose as to the advisability of a public statement regarding a test ban while discussions toward an international agreement on nuclear testing were in progress. Some delegates felt that public statements might embarrass our delegation and prejudice chances of a successful outcome of the talks; others said that FAS should present its viewpoint publicly in order to put the widely publicized statements of Sen. Albert Gore and AEC Commissioner Murray into proper perspective. It was agreed to issue the following statement, which was released Nov. 24, 1958.

#### FAS POLICY ON PERMANENT TEST BAN

Recent calculations, based on official information, indicate that there are probably enough large nuclear bombs in present stockpiles to destroy the human race. This could be accomplished by the blanket of radioactive material which could be laid down by the explosion of a massive number of nuclear bombs. For example, if even a fraction of present stockpiles were exploded on the territory of even a large country, a deposit of radioactive material would be produced of such intensity that all life in the open would be destroyed, and life would not be possible on the surface of the earth until about one to three years had passed.

It would furthermore be possible for a fanatical ruler to pull down the entire human race to destruction. With a stockpile of the size that now exists, it is possible to cover the entire earth with a radiation level which for ten years would remain sufficiently intense to prove fatal to all living beings on land. This could be brought about by a decision of a small number of people.

The argument has been advanced that continued testing is important to develop defensive weapons that would be effective in providing protection. But expert opinion has been given to the effect that there is not, and very likely never will be, any meaningful defense against massive attack. It may be possible to inflict destruction on an opponent, but no nation can any longer give protection and security to its own people. 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.

We have thus come to a new period in history, in which the human race can destroy itself. The new weapons of mass destruction are too dangerous to be left under sovereign national control. In these circumstances our primary goal

### HOW TO INCREASE FAS EFFECTIVENESS

Rather than see a decrease in the effectiveness of FAS in the face of rising costs of operation, the FAS Council voted unanimously to raise the basic membership dues rates for the first time since the chartering of the organization in 1946. This long delayed step was made necessary by the following considerations:

Increases in the cost of office supplies and equipment, postal rates, and many other items are putting the squeeze on our bank balance. The Executive Committee is also attempting to pay the Washington Office personnel at salaries more commensurate with their responsibilities, in order to maintain a competent staff. In addition, it has allocated funds for commercial services to streamline our mailing and publishing functions.

As a national membership organization, FAS must keep its members informed of current issues and activities, and this involves paper, printing and mailing list expenses—all of which are costly for as small a distribution as ours. A substantial membership increase would, of course, bring these costs proportionately downward. A concerted membership drive requires a large investment, however, and it is hoped with the dues increase we may be in a better position to finance such a campaign.

The Council would like to be able to unite more of the membership into local effective units, branches or chapters. More direct communications between local units is also necessary. The next budget will be drawn up with these aims in mind.

We look forward to stabilizing our financial situation and ensuring that FAS can act quickly in a period of emergency in support of its objectives. The history of accomplishment of FAS is remarkable, particularly in view of its marginal financial resources and its relatively small membership. Your continued support and that of your colleagues will ensure an even greater success of FAS in achieving the aims for which it was founded.

Len Herzenberg  
Treasurer

#### II. Organizational Items

a. FAS' application for membership in the AAAS will be acted upon in the Fall, 1959.

b. A change in the By-laws relating to proxies at Council meetings was passed.

c. The Cleveland and Pittsburgh Branches are expected to apply for Chapter status in the near future.

d. A budget of \$14,700 for 1959 was approved by the Council on the recommendation of the Executive Committee. The new budget allows for printing the NEWSLETTER, rather than the photo-offset previously used. A report by the Washington Office on membership and finances showed that through Oct. 31, 1958, FAS received \$11,208 and spent \$11,487. On Nov. 12, 1958 FAS had a cash balance of \$4802 and a total membership of 2122 (1618 at-large, 504 chapter), approximately the same as last year. The projection of expenditures and receipts to the end of 1958 by the Treasurer and the Wash. Office Staff indicated an expected deficit of approximately \$1000. The proposed '59 Budget anticipated an income of \$10,930 from predictable sources, but noted that there would be a budget deficit of \$3770 unless our membership increased substantially or unless dues were increased. Copies of the report summarized here are available to members on request.

e. The Council acted favorably upon recommendations of the Executive Committee to raise FAS membership dues. The new rates will be \$7.50 annually, \$4.00 for those with incomes less than \$4500 per year and \$2.00 for bona fide students. Chapters will still retain \$2.00 from the dues of their members and forward the balance to FAS. Supporting membership dues remain at \$10 and patrons at \$25 per annum.

must be to bring these weapons under international control. A universal test cessation, under international inspection, offers promise of being the most practicable first step to-

(continued over)

ward international control of mass destruction weapons.

Although it is the responsibility of the military to seek further development of weapons of all types, it must be stressed that security is not available through military means. Therefore an objective of moving toward effective disarmament must come before considerations of technical improvements which further testing might produce in nuclear weapons.

We urge that the parties negotiating on a test cessation agreement not stand on any narrow position which will impede an agreement leading toward the major goal. The negotiators must adopt all reasonable measures which will provide satisfactory assurance to all parties that no further significant nuclear weapons development will occur.

An acceptable agreement must include the immediate establishment of an effective test detection system, which the experts' conference reported to be technically feasible. As to the initial period of test cessation, we should agree to a permanent ban, subject only to the condition that the detection system be put into operation within an agreed period. Certainly any cessation period limited in duration must be longer than the period required merely to prepare another series of test explosions. The people of all countries may rightly demand that the governments of all nuclear powers show clearly that they sincerely desire to end the testing of nuclear weapons.

**b. Science and Mathematics in American Education**—The Education Committee (Mohawk Chapter) submitted its report as a basis for policy formulation by the Council, in the area of US support for science and mathematics education. The following motion passed unanimously: "The FAS Council gratefully receives and approves the report of the Education Committee. The Council recognizes that this is a valid field of action for the FAS and asks the Executive Committee to work with the Education Committee to recommend specific legislative measures and to contact the proper legislative officials in order that the results of the Mohawk group be made available."

## SUMMARY REPORT OF THE FAS EDUCATION COMMITTEE (MOHAWK CHAPTER)

### Secondary Schools

**Findings:** An acute shortage of science and mathematics teachers exists in the nation's secondary schools. This threatens a further serious deterioration in an already unsatisfactory level of instruction in these subjects. Too few students study science and mathematics in high school, thus contributing to a national shortage of scientists, engineers, and science and mathematics teachers, and also to a low level of public understanding of science.

Teachers' salaries in the schools are much too low to attract enough able people to a teaching career. This is particularly so in the sciences and mathematics because of the competition of industry and government for people with technical training.

Science teachers must be better informed about modern science, and there is need for a greater understanding of science by elementary teachers.

Inadequate efforts are now being made to identify gifted students early in their schooling and to give them proper counsel and guidance in choosing a suitable program.

**Recommendations:** Teachers' salaries must be raised substantially. Because the teacher shortage is worst in science and mathematics, salaries of these teachers should receive special attention. Temporary Federal financial aid to the states is necessary to make this possible. Federal aid should, at the least, be given to raise substantially the upper attainable limits of all teachers' salaries and to raise all salaries of science and mathematics teachers.

Testing and counseling of all students should be encouraged, as it is in the National Defense Education Act of 1958. Such testing, should begin at least in the 8th or 9th grade, and preferably earlier, in order that

gifted children can be directed into a suitable program. Provisions of the Act of 1958 to provide money for science equipment for schools are excellent.

The National Science Foundation has the necessary authorization but needs more money to expand its summer-institute program for teachers to provide more fellowships for advanced study by teachers, and to support the development of modern science courses in science and mathematics.

Incentives for teachers to upgrade their knowledge and teaching ability should be provided by a salary system recognizing merit. In addition, Federal prizes and fellowships for the best teachers would be desirable.

All states should have full-time supervisors in science and mathematics. Provisions in the Act of 1958 encouraging this are good.

### Federal Scholarship Program For College Undergraduates

**Findings:** There are many qualified students who fail to attend college for financial reasons, although precise figures are not available.

A Federal scholarship program could stimulate intellectual endeavor, provoke schools and communities into strengthening their science, mathematics, and language curricula, and encourage teachers and parents to identify the gifted student and urge him into a college-preparatory course.

**Recommendations:** A Federal scholarship program should be instituted for the purpose of insuring that the opportunity of attending college is made available to all high school graduates ranking in the top 20% in ability, as determined by performance in competitive examinations. We envisage that these scholarships shall be awarded to individuals selected from this group on the basis of need. The examinations should place particular emphasis on achievement in science, mathematics, and languages, but no stipulation concerning a student's field of concentration should be attached to a scholarship. The cost of such a program in full operation should be at least \$100 million a year and should provide a minimum of 40,000 new four-year scholarships a year.

The loan program in the Act of 1958 is good, but it should be supplemented by the scholarship program.

### Federal Fellowships For Graduate Study

**Findings:** The low number of graduate students is not limited at the present by university facilities but rather by the number of interested and qualified persons. However, it is undoubtedly desirable that graduate facilities be expanded in the expectation that such facilities will be needed in the years ahead.

**Recommendations:** We doubt that the Act of 1958 will be effective in increasing the number of graduate students in the near future or in promoting a significant expansion of graduate facilities. For the former purpose we should prefer to see made available more NSF fellowships for graduate students and similar fellowships in non-scientific fields, with no restriction that the student be enrolled in an expanded program. For the latter purpose, we favor direct federal grants to the universities on a matching basis.

One must beware a fellowship program that seriously reduces the number of students in any field willing to take teaching fellowships, unless alternative sources of instruction are provided to the colleges.

This report is not a final one but is to be revised after consultation with other organizations and people interested in this area. Comments and suggestions from members will be gratefully received and should be sent to James B. ... Chairman, FAS Education Committee, 343 Terrace ... Schenectady, New York. In discussion of the report, several Council members asked that the introduction be based on the basic human need for knowledge of man himself and the world he lives in rather than the study of science as a satisfaction in itself. They felt that this would be more apropos of a report on education than one concerned mainly with the immediate defense needs of the country.

**OUTER SPACE** (continued from page 1)

1959 by the House Select Committee on Astronautics and Space Exploration, one finds this point underlined in such statements as, "It would be highly impractical not to face the reality that space technology, like nuclear energy, can be used for war as well as for peace" . . . "The military potentialities of space technology, which the US would prefer to see channeled to peaceful purposes, are greater than general public discussion to date suggests" (NYT, 1/11).

In assessing the position of the Soviet space accomplishment as compared with that of the United States, this report records that "several qualified witnesses . . . have estimated the Soviet over-all lead over the US as 12 to 18 months." Further it quotes one "dispassionate, long-term student of space technology" as estimating "that if the United States attempts a strong thoroughgoing effort, it will take at least 5 years to close the gap." These views were immediately challenged by Vice President Nixon who in an informal discussion with newsmen (Wash. Post 1/12), contended that the United States was ahead of Russia in developing military missiles and was catching up fast in other phases of the space race.

In his State of the Union address (1/9), President Eisenhower did not discuss the US position vis-a-vis the USSR in the missile field. Rather, he stressed that "our military and related scientific progress has been highly gratifying. Great strides have been made in the development of ballistic missiles. President Eisenhower also pointed out that "Modern weapons are exceedingly expensive . . . This year we are investing an aggregate of close to \$7 billion in missile programs alone." It seems clear that an extended debate in Congress is in prospect on the overall military posture of the US with particular emphasis on missiles and outer space.

**Need for Space Regulations**

One outstanding problem accentuated by the unannounced launching of the Atlas I satellite by the US, is the establishment of international regulations for space launchings. This problem has been stressed in a staff report entitled "Survey of Space Law", issued on Dec. 21, 1958 by the House Space Committee. The report said that there was a "very considerable risk" that an unannounced satellite might be wrongly identified as an incoming intercontinental ballistic missile. The Committee warned that the nations of the world could be obliterated by an accidental war unless immediate steps were taken to establish international regulations for space launchings (NYT, 12/22).

**RED CHINA** (continued from page 3)

scientific information. Advanced students are also required to be proficient in one or more foreign languages.

Wilson's article is replete with interesting observations about the life of scientists in Communist China as well as some more detailed information concerning specific scientific projects.

**FAS NEWSLETTER**

Federation of American Scientists  
1805 H Street, N. W.  
Washington 6, D. C.

**Time Value: Dated Material**

No. 59-1

Form 3547 Requested

**KILLIAN** (continued from page 1)

tories as well as that supported by federal funds in private laboratories. Among the first tasks of the Council will be the nurturing of important new scientific fields and the strengthening of those which are assuming new importance. The Committee recommended large capital investments in meteorology, geophysics, biophysics, linguistics and other fields which need great attention. Each situation is to be analyzed to decide whether new laboratories are required and/or whether universities and private institutions will be more or less effective than a government facility. The Committee stressed the need of government policy to encourage private support of science. The role of the Council will be to use the financial resources of the government to complement, aid, and encourage, not to supplant, the traditional private support for research.

**Other Panels**

In his address, Dr. Killian referred to the work of other panels of the Committee. The recommendations of the panel on science and foreign affairs led to the State Department's renewed interest in science advisors and scientific attaches. The recommendations of the space science panel led to the creation of the NASA, and the views of the panel on science information led to the designation of the NSF as the coordinating center for such information. The education panel as yet has not submitted its report.

**RESEARCH SCIENTIST PROGRAM BEGINS**

The first group of foreign post-doctoral fellows supported by the expanded Visiting Research Scientist Program of the International Cooperation Administration has begun to arrive in this country. These fellows, 150 in all, from over 40 nations, were chosen by their countries' major scientific bodies (e.g. Academies of Science) as representatives of the best young scientific talent of the country. Each will spend one or possibly two years doing research at a university or government laboratory selected for him by the National Academy of Sciences.

M. H. Trytten, Director of the Office of Scientific Personnel of the NAS, which is directly responsible for the program's administration, pointed out in the News Report of the NAS-NRC (Sept.-Oct. 1958) that ". . . there seems to be continued enthusiasm for this type of program, and it would seem probable that a continued effort of this kind would be supported."

**GENEVA TALKS** (continued from page 3)

from earthquakes; and 2) the inclusion of Communist China in a world-wide detection network. Concerning the first point, Mr. Dulles indicated that a workable system might have to involve a size limit below which testing is permissible. With regard to the second point, Mr. Dulles did not appear to be too concerned, indicating that he hoped eventually that the inspection system would be worldwide.

Sec. 34.66, P. L. & R.  
U. S. POSTAGE  
PAID  
WASHINGTON, D. C.  
PERMIT NO. 9124

EMERY I SIMS  
1644 TAYLOR STREET  
SAN FRANCISCO 11-  
M-2 -CALIF-