

F. A. S. NEWSLETTER

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FAS SCORES TRUMAN ON TESTING

[The following statement was authorized by the FAS Executive Committee and released on Nov. 15:]

Former President Harry S. Truman, in a November 8 syndicated article urged an early resumption of underground nuclear testing on the basis of arguments which seem to us inconsistent and ill-advised. No very large underground tests have been attempted, but because "important" nuclear tests have been carried out underground without contributing to atmospheric radioactive fallout, he concludes that "there seems to be no longer any valid reasons for stopping experiments underground." This statement overlooks the main reasons for wanting to stop all nuclear tests on a worldwide basis. Only by banning tests of all kinds under a universal agreement will it be possible to prevent the development of nuclear weapons programs by many other nations. Mr. Truman appears to welcome the prospect of having our traditional ally, France, join us as a nuclear nation but fails to recognize that China and many other nations might soon acquire nuclear status. With nuclear weapons based in many countries it will be almost impossible to prevent accidental or deliberate war. Avoiding increased peace-time fallout is important, but avoiding nuclear war by gradually tapering off the arms development race is much more important.

Similar Hopes Shared

Mr. Truman expresses the hope that we might "control internationally all (nuclear) weapons to assure the nations that no rash act by a power-mad dictator could plunge the world into disaster," a hope which we share. However, resumption of nuclear testing now would actually compromise the chances of realizing this hope. Since renewal of the negotiations at Geneva on October 27, the Soviets have finally agreed to consider a reappraisal of the technical basis for the control of underground tests. There is now a good chance that, on the basis of such a reappraisal, agreement can be reached on the problem of nationality distribution within inspection teams, a point of conflict which has been holding up negotiations. Mr. Truman's pessimism is based largely on the Soviet rejection of the "Baruch Plan" for the international control of atomic energy during his administration. Whatever the reasons for failure in the past, we must not risk the interruption of positive progress toward a test-ban now and the broader disarmament that might follow, except for the best of reasons.

Ex-President Truman seems to claim that much other important scientific investigation would stop if we were to discontinue nuclear tests. He says "You can never freeze any discovery. You must go on experimenting. There can be no improvement without continuous experiments and tests. We know that from what we see in everyday life." As scientists we are of course strong partisans of advances in pure science and in applied science where it will benefit mankind. But in the field of nuclear explosives we foresee vastly more harm than good to mankind if experimentation is continued without limit. It is just because "there can be no improvement without continuous experiments and tests" and because large explosions can be detected that we can essentially freeze discovery in this particular field, if the nations can agree to a reasonable system of controls. It is on the system of controls that we now need intensive research, to make these more effective and to facilitate political agreement.

The Federation of American Scientists urges that we continue our negotiations in the calm atmosphere of the present moratorium on testing, in a sincere effort to reach an effective agreement before it is too late.

Geneva Talks

Early in November the Soviet Union agreed to participate

JAPAN HALTS USE OF BROWN RICE

The high strontium-90 concentration in the hulls of brown rice has led to a 90 per cent reduction in consumption of this staple in the Japanese diet. People have turned to polished (white) rice, from which the hulls have been removed. This was discussed by Japanese biophysicist Yasushil Nishiwaki at a talk at St. John's College in Annapolis on Dec. 2 (W. Post, 12/4). The strontium-90 level in brown rice in Japan has reached 100 to 200 strontium units, which is less than the levels found in a number of samples of US wheat. In wheat, as in rice the hull which is removed by milling contains the majority of the strontium-90. Thus white bread has substantially fewer strontium units than whole wheat bread.

Appearance of thyroid cancer in Japanese who were children in Hiroshima when the first atomic bomb was dropped there in 1945 was also reported by Mr. Nishiwaki. He is a member of the Special Radiation Effects Committee of the Science Council of Japan, and is currently here as a research fellow at the California Institute of Technology. Only a few thyroid cancer cases have appeared, but they are attributed to radioactive iodine, which concentrates in the thyroid.

The October issue of Nuclear Information, published by the St. Louis Citizen's Committee (4484 West Pine Blvd.) discusses questions raised by the presence of strontium-90 in foods. Their bulletin states that the strontium-90 content of foods represents a risk of unknown magnitude, which can be reduced by removal of this radioactive substance. Other methods of reducing the possible hazard, such as use of mineral calcium pills in place of natural sources of calcium, should not be undertaken without a physician's advice. The current bulletin contains answers to 30 questions which parents most frequently ask the Committee regarding the effects of strontium-90 in milk. Milk from the St. Louis milkshed shows the highest average strontium-90 content among the 12 cities now being tested by the US Public Health Service. After a series of conferences with the local dairy, the St. Louis Committee reported that the Pevely Dairy Company has initiated research into the problem of removing strontium-90 from local milk on a commercial basis. Dean Alexander S. Langsdorf, president of the Committee, said that the research program is one of the first of its kind to be announced by an American dairy company.

in a re-evaluation of the detection problem but later restricted the area to be considered so as to exclude possible improvements in the proposed inspection system (W. Post, 11/5). Finally, on Nov. 24, the Soviet Union agreed to begin the scientific discussions on terms acceptable to Britain and the US and these began the next day with what the head of the US scientists, Dr. James B. Fisk, described as a "good meeting."

This Fall the US and Britain extended their voluntary test bans until Dec. 31. Britain has now pledged that it will not resume tests as long as "useful discussions" continue at Geneva (W. Post, 11/11) and the Soviet Union has again stated (11/19) it will not test until the West does. The future course of the US is not yet announced.

Secretary of State Herter has stated that he would favor continuation of test suspension for "a matter of weeks only" (W. Post, 11/13); AEC Chairman McCone thought extension might be on a week-to-week basis (W. Post, 11/23); and Sen. Jackson, Chairman of the House-Senate Atomic Energy subcommittee on weapons, urged resumption of underground and upper atmosphere tests (W. Post, 11/23).

The issue entered actively into the political arena when Gov. Rockefeller proposed the resumption of tests next year in which view he was strongly supported by former Pres. Truman. Nixon disagreed sharply saying that anyone who wanted to resume testing just didn't know the facts (NYT, 11/13).

(Continued on page 4)

STUDENT LOYALTY AFFIDAVIT ATTACKED

The revolt against the student loyalty oath required under the National Defense Education Act of 1958 is spreading. Recently Yale and Harvard Universities joined the list of nearly 20 institutions which have publicly declared their refusal to participate in the Federal student loan program while a loyalty affidavit is required (W. Post, 11/18). This action by Yale and Harvard necessitates their relinquishing almost half a million dollars in funds available from the Federal government as loans to needy students. Educators have argued that the oath requirement is an invasion of academic freedom and that it casts a slur at students by demanding of them something that is not required of other recipients of Federal aid. In addition to the action taken by individual colleges and universities the American Council on Education, a private organization with a membership of 1047 institutions, has formally reaffirmed its opposition to the loyalty oath. The Council's Committee on Relationships of Higher Education to the Federal Government adopted a new resolution opposing the oath but decided against further representation to Congress on the matter. During the last session of Congress, the Council had urged repeal of the loyalty requirement but the motion to eliminate the provision was narrowly defeated.

CIVIL DEFENSE GUIDE ISSUED

More than one million copies of a civil defense action guide were mailed to households in the Washington, DC area in the latter part of November. The guide takes a definite stand on the evacuation-vs.-shelter question, advocating evacuation for those in the more heavily populated part of the area. If there is time, Civil Defense officials hope to be able to move 200,000 people per hour 20 miles from the Washington Monument (W. Post, 11/18). Local governments and civil defense agencies distributed the 16-page booklet, which contained brief statements on warning signals, home shelters, decontamination, survival supplies, and evacuation procedures. A large map of the area, with evacuation areas and designated one-way evacuation routes, was also included.

A report on the activities of the civil defense committee of the American Chemical Society since its formation in July 1957, appears in the Oct. 19 issue of the *Chemical & Engineering News*. The committee has attempted to encourage a civil defense policy in which chemical and biological hazards are considered in addition to radiation and other hazards of a nuclear attack.

SCIENCE AND EDUCATION

An instructional TV experiment to start next fall has been announced by a group of prominent midwest educators. Courses taught by outstanding teachers recruited nationally will be televised from a DC-7 aircraft 20,000 feet over Indiana. Coverage from the "flying TV station" will be a circle of some 300-400 miles in diameter and will include parts of Illinois, Indiana, Kentucky, Michigan, Ohio and Wisconsin. Programs will be transmitted from facilities at Purdue University (tape and live) to the aircraft and then retecast to participating schools and colleges. Participation will be voluntary and the instructional programs will be determined after consultation with regional school authorities. Estimated cost for "tooling-up" and for the first year of broadcasting is nearly \$7,000,000 and will be financed by private gifts and grants from foundations, industrial corporations and others. Technical assistance thus far is coming from Westinghouse Electric, CBS Laboratories and General Dynamics Corp. At first, two different programs will be televised from the plane at the same time via two "wide band" UHF transmitters. Ultimately this may be increased to six. The experiment will be conducted by the Midwest Council on Airborne Television Instruction in conjunction with the Purdue Research Foundation.

Sen. Humphrey Report on NSF

In a forword to a 96-page Senate committee report on the "National Science Foundation and the Life Sciences" (prepared for the Committee on Government Operations, 11/16). Sen Humphrey (D, Minn.), chairman of an International Health Study, calls for increased Federal support of fundamental research in the life sciences. "Pure research is still a stepchild" he states and further indicates it receives only a small fraction of sums allotted to "catagorial" research aimed specifically at certain diseases. Science, he states, "must be free to alter course and exploit new-found routes

OUTER SPACE DEVELOPMENTS

Several meetings were held throughout the month of November at the United Nations between Mr. Vasily V. Kuznetsov of the Soviet Union and Mr. Henry Cabot Lodge of the United States in an attempt to establish some form of space research cooperation between the two nations.

While the political debate went on with little hope for early agreement, American and Soviet scientists sat together in Washington at the 14th annual meeting of the American Rocket Society, and exchanged useful information on the accomplishments and projects of the two countries. AEC Chairman John A. McCone addressed the meeting on Nov. 18 and discussed the possible applications of nuclear energy to space technology "first as a source of energy to propel the rocket itself and second as a source of electrical power to meet the demands of satellites and space probes."

Leonid I. Sedov, chairman of the Astronautics Commission of the Soviet Academy of Sciences, praised the efforts of the US in space research and asserted that while the Soviet Union has the rockets required to send a man in space, the problems of protection against radiation and of re-entry in the atmosphere have not been solved. He and other Soviet delegates discussed some of the problems which were solved before the three Russian luniks could be launched, reported on some of the data gathered by Sputnik III and explained the techniques used by the Soviet scientists for sending animals in outer space.

Shortly after this meeting, unconfirmed radio reports announced that contacts with Lunik III had suddenly been lost and that Russian scientists speculated that their latest space vehicle might have collided with a meteorite.

US Space Probes

In the US both the Air Force and the Army continued their scheduled series of tests using different types of space probes. On Nov. 7 Discoverer VII was fixed into a polar orbit from the Vandenberg Air Force Base. As in previous Discoverer shots, the satellite was designed to release a capsule following a radio signal from earth. However, malfunction of the electrical equipment on the rocket prevented ejection of the capsule. A further attempt on Nov. 20 met with a similar failure. Discoverer VIII was successfully put in orbit and positive indications were obtained that the capsule was ejected as planned. Apparently, however, the capsule's parachute failed to open and the capsule was destroyed by the impact against the waters of the Pacific Ocean.

A five-stage rocket equipped with instrumentation designed to broadcast counts of electron density at different heights was successfully fired on Nov. 11 from Cape Canaveral. The rocket reached an altitude of 1050 miles and returned to earth 28 minutes after the firing.

On Nov. 26 a three-stage Atlas-Able rocket was fired, again from Cape Canaveral. The rocket was supposed to carry a 372 pound payload to the vicinity of the moon. This payload included a small rocket engine which could be radio-controlled from earth. It was hoped that this engine could slow down the satellite at the appropriate moment and make it orbit around the moon. However, due to breakage of a protective plastic covering of the nose cone, the payload was torn away from the rocket only 45 seconds after the launching.

Critchfield Resigns

On the political front, Charles L. Critchfield was appointed Director of the Pentagon's Advanced Research Projects Agency on Nov. 5 to replace Roy W. Johnson who decided to retire, effective Nov. 16.

Dr. Critchfield indicated at first that he was willing to accept the appointment. However, after Rep. Chet Holifield made it known that he proposed to investigate the appointment because of possible conflict of interest, Critchfield withdrew his acceptance. Dr. Critchfield is employed by the Convair Division of the General Dynamics Corp. and the Defense Dept. had appointed him director of ARPA while agreeing that he could retain his salary from Convair.

rather than be forced to attack specific targets . . ." and again " . . . until we give science its head, meaning freedom to search where it will, we may unwittingly be weakening science's thrust forward toward ultimate victory over disease."

Humphrey indicates that both pure and applied research are needed but that scientists have reported to the subcommittee that a more balanced relationship would be more effective toward conquering disease.

BOOK REVIEW

THE CHALLENGE OF SCIENCE EDUCATION. Edited by Joseph S. Roucek. Philosophical Library, Inc. New York, N. Y.

This book is a survey of what has been done and what can be done by a more efficient pooling of "the efforts of scientifically-minded citizens and of scientists to enable the free world to regain and then maintain a position of scientific superiority in the cold war era."

It is a collection of thirty-two articles, some of them on science education in general, or on education in a special field. Other articles are reports on education meetings, while some are the results of questionnaires regarding education in certain branches of human endeavor. Thirty-two authors contributed, and a Report on Physics was prepared by the American Association of Physics Teachers. The editor has made a valiant attempt to present in some coherent fashion an encyclopedic, but yet incomplete number of papers which discuss education in all its ramifications. It is left to the reader to ponder how the increased pooling of efforts is going to enable the free world to gain a position of scientific superiority. However, if the reader likes to read encyclopedias and does not mind the risk that the specific answer he is looking for, is not given in his abridged encyclopedia, he is in for a fascinating time.

You find the answer to many questions! What is science? (defined in many places); How did Marx and Freud undercut the concept of scientific objectivity? What is the cause of our crisis in science education? (not the USSR, but rapid worldwide, technological advance) Can we identify potential scientists? Are there conflicts between religion and science? What position should science teachers take on religious issues? What is the College Board Program for modernizing the teaching of High School Mathematics? What recent proposals have been made to improve the teaching of Physics, of Medicine at the college level? (two excellent chapters). Two other questions are answered in an entertaining manner: What is the origin and the role of the murder mystery, and of science fiction?

The reviewer personally always wondered why an honor graduate in physics at Yale was denied a post in a New Haven High School (p. 179), and why so many similar cases occur. Also why retired scientists, or scientists in regions with many government or industrial laboratories are looked upon warily as part-time teachers of their respective disciplines by professional educators, even when various shortages exist. Apparently, since one needs a license as an engineer, a lawyer, a physician, a preacher, one also needs a license as a teacher. It seems to me that a juxtaposition of non-equal terms is attempted. The subject matter of the professions mentioned is a more or less circumscribed body of information (physics, law, medicine, religion). The subject matter of teaching as such is a vague concept. The method of teaching given subject-matter is determined by the subject (experimental, logical), and varies from subject to subject. So it seems that there are no methods of teaching per se but only methods of teaching a discipline. This is tacitly recognized in two thirds of the book under: Secondary Education, (two of the three "Selected Areas" are special disciplines). In the chapter on College and University Education all selected areas of discussion are special disciplines. Under the heading "Auxiliary Aspects" activities of the Federal Government, of Learned Societies and groups interested in Adult Education are discussed; in the last chapter "Comparative Aspects" of science education in the USA (Killian's remarks at St. Albans School, Washington, DC), Great Britain (Kenneth Laybourn) and the USSR (L.A.D. Dellin) are discussed. The book ends with a masterful defense of classical education for all scientists by Heisenberg.

Besides the Table of Contents, there is only one index given. This index is characteristic of the encyclopedic nature of the book. It contains the names and the page reference of all persons mentioned in the 32 articles. A subject index, though maybe less entertaining, would have been of great help to the reader. All in all, an amazing book and certainly not limited to a personal viewpoint, as some other books on the crisis of Science and Education.

H. G. Dubuy

BARENBLATT BEGINS TERM

Lloyd Barenblatt, former Vassar College teacher who refused to tell the House Committee on Un-American Activities whether he had ever been a member of the Communist Party, began serving the six-month prison term imposed on him for his contempt. His five-year fight against the charge ended when the Supreme Court, which had previously

PEACETIME USE OF ATOMIC ENERGY

The disappointing response of European utilities invited to participate in the EURATOM program (only 2 utilities submitted plans for the construction of atomic power plants with US aid) was a factor in prompting the Joint Congressional Atomic Energy Commission to undertake a full study and reappraisal of the objectives, policies and programs of the Government in the areas of atomic science and technology. Robert McKinney, first US representative to the IAEA, was appointed director of the study committee (Science, 11/6). In a speech before the Atomic Industrial Forum (see below), Mr. McKinney stated that some of the reasons for the necessity of the reappraisal were "the emergence of actual experience with the cost of reactor construction and operation, both at home and abroad; changes in the supply and demand for fossil fuels and fissionable materials; the replies of European utilities to the EURATOM invitation; prospects for an effective safeguards system; public concern with the disposal of radioactive waste; the increasing availability and use of radioisotopes and radiation; and prospects for disarmament and cooperation with the Soviet Union."

Atomic Industrial Forum

The sixth annual Atomic Industrial Forum was held in Washington, November 2-4. John A. McCone, in addressing the delegates, called for a great scientific and technical effort on our part if we are to continue our leadership in the atomic field. He described Soviet progress in atomic development and praised the speed with which the Soviets design and build equipment. McCone assured the delegates that our uranium supply would be sufficient and that the price would not change "barring uncontrolled inflation or rising interest rates." (W. Post, 11/4). Chauncey Starr, general manager of Atomic International said that industrial firms are losing their enthusiasm and optimism about the commercial development of atomic energy. He blamed this loss of enthusiasm on insufficient profit-motivation, a decrease in competition from Great Britain and the Soviet Union, and the increased availability of conventional fuels. Starr complained that far more was being spent for development of military reactors than for those for civilian use. He spoke out against the growth of the national laboratories (Argonne, Brookhaven, Los Alamos, Oak Ridge, Lawrence, Livermore, and Ames are the major ones) and said that the atomic industry finds itself in direct competition with these laboratories for government support (W. Post, 11/3).

Government-Industry Conflict

A major conflict over these laboratories appears to be developing between industry and the AEC. Warren C. Johnson, head of the AEC General Advisory Committee, expressing his personal opinions on the question, openly opposed the industry demands that the national laboratories get out of the reactor development business. Among other reasons for continuing the reactor work at these laboratories, he stated that the interaction between them and the universities for research and the training of students, was the "most important reason" for continuing the present setup.

upheld his conviction in a 5-4 decision, rejected a petition for rehearing submitted by the American Civil Liberties Union.

Campaigns against alleged subversion have failed recently in two states. In Florida, the House Committee on Public Schools killed a bill to bar so-called subversive books from public schools and colleges. The bill, a result of an intensive campaign by several housewives, was opposed by the State Department of Education and various educators. In Illinois, a bill to create a "seditious activity and subversive propaganda" commission to study education, industry, labor and government, as well as one to authorize investigation of school textbooks, was defeated (Amer. Civil Liberties Weekly Bulletin).

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: E. Korn and Irving Shapiro, of the Washington Office Staff; Writers: M. G. Fuortes, E. Korn, E. Kravitz, F. K. Millar, H. Odell, N. Seeman, F. Stern; Production: I. Shapiro.

DEFENSE AND NATO

The \$41 billion dollar defense budget the Administration will send to Congress in January, reflects the President's determination to keep defense estimates within the limit of current spending. Because of the mounting cost of materials, steep cuts in existing programs and forces have been ordered for the military services. The Air Force, which has been getting about half the defense budget, received the biggest cutbacks. Chief among these was the decision to delay and "reorient" the B-70 development program, a decision that may signal the end of the line for manned strategic bombers. The Administration plans to seek Congressional Committee approval for eliminating a \$380 million nuclear-powered aircraft carrier and substituting a conventional flattop for \$120 million less.

Manpower cuts have been ordered for both the Air Force and the Navy. No troop reductions for the Army are contemplated next year. However, there have been reports of sizable Army manpower cuts in 1962 as well as suggestions within the Administration that the Army be scaled down to a small-war type of force.

NATO Conference

Delegates to the annual NATO Parliamentarians' Conference heard Adm. Jerauld Wright, NATO Commander in the Atlantic, warn that Soviet ballistic-missile submarines will be a threat to the Western nations within a year. Secretary of State Herter reassured the lawmakers that the US would continue to give full support to NATO and urged the Western European nations to take on a bigger share in supporting the alliance. Among the recommendations agreed on by the committee for consideration by the NATO Council were: annual summit meetings for NATO chiefs of state; more initiative on the part of the Council to bring about a foolproof disarmament; a vigorous NATO-wide cooperative effort in peaceful outer space research, including a bigger NATO science fellowship program.

Free Report

Practical guides and proposals as to the kind of educated people the West needs, i.e. the factors to be considered in weighing the supply and demand of educated people, especially scientists and engineers, are given in the report of Robert McKinney to the Subcommittee on Scientific and Technical Cooperation of the Atlantic Congress, which met in London, June 5-10. This report may be obtained without charge by writing The New Mexican, Inc., Post Office Box 1705, Santa Fe, New Mexico. The title of the report is: **On Increasing the Effectiveness of Western Science and Technology.** Proposals regarding the rapid industrialization of underdeveloped countries, including student, technical, and scientific manpower exchange, are particularly worth reading. The articles cited indicate to some degree, actions by which survival of Western ideals of individual dignity may be assured during a period of competition with a collectivistic society.

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ANTARCTIC TREATY SIGNED

After more than six weeks of direct deliberation (and a year of groundwork) representatives of twelve nations signed an agreement on Dec. 1 governing future developments in the Antarctic. The treaty, to become effective after ratification by the twelve governments, has been hailed as "precedent-making" and, as Pres. Eisenhower stated "an inspiring example of what can be accomplished by international cooperation in the field of science and in the pursuit of peace."

Treaty Provisions

The major provisions provide that:

Antarctica be used only for peaceful purpose (i.e., all military operations are prohibited).

Any one of the treaty nations may make inspections of any Antarctic area at any time.

Nuclear explosions of any kind are prohibited pending general international agreement on such explosions.

Present territorial claims are frozen; no new or additional claims can be made.

The nations under agreement will continue research and exchange of specialists and information.

Disputes are to be resolved among themselves or referred to the World Court if all parties involved agree.

Any UN member may become a treaty member. Non UN members can become a treaty member upon unanimous consent of the original twelve.

DISARMAMENT (Continued from page 1)

In one of the more thoughtful statements, Sen. Humphrey proposed a further one year extension of the test ban during which time a ban be negotiated with complete inspection on all tests over 5 kilotons. Another 2 year voluntary moratorium would then be effected from that time with the hope that detection methods would be sufficiently improved to distinguish earthquakes from explosions (Speech, Pontiac, Mich., Oct. 30).

French Tests

The "nth nation problem" (often warned against by FAS among others) came closer to reality when France declared before the UN (W. Post, 11/5) that it had built an A-bomb which it will test in the Sahara in a desolate region of southern Algeria. This announcement met with violent opposition not only from the African nations who feel they are directly concerned but from the world at large. On Nov. 20th, the General Assembly passed a resolution (51 to 16) which called on France to "refrain from such tests." The United States and Britain supported France (W. Post, 11/21). The next day only France voted against a resolution passed by the General Assembly asking that all states voluntarily refrain from testing. Britain and the US abstained. At this point, nothing short of total nuclear disarmament by the US, Britain and Russia seems likely to stop the French tests.

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