

F. A. S. NEWSLETTER

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

FAS ENDORSES UCS MEETINGS

The Union of Concerned Scientists, which has its headquarters in Cambridge, Massachusetts, has planned a series of events surrounding March 4 to observe the necessity for social consciousness in the scientific community. Their plans include three sessions of speakers, and UCS expects to have I. F. Stone, Michael Harrington (Democratic Representative from Massachusetts), M. L. Goldberger of Princeton University, and Matthew Meselson of Harvard University among their speakers. This year UCS has joined with the Federation of American Scientists, which has endorsed the March 4 observance and will actively participate. The resources of the FAS Washington office will also be available to people seeking to arrange a March 4 event. A small budget is available in case of real need.

The Union of Concerned Scientists has issued the following announcement of the sessions, which are to concentrate on the arms race and its control:

A year ago at MIT, an all-day meeting was held to symbolize a dedication on the part of scientists and engineers to positive action on the social and political problems in which science is involved. The call to March 4th meeting said in part:

"Misuse of scientific and technical knowledge presents a major threat to the existence of mankind. Through its actions in Vietnam our government has shaken our confidence in its ability to make wise and humane decisions. There is also disquieting evidence of an intention to enlarge further our immense destructive capability.

"The response of the scientific community to these developments has been hopelessly fragmented. There is a small group that helps to conceive these policies, and a handful of eminent men who have tried but largely failed to stem the tide from within the government. The concerned majority has been on the sidelines and ineffective. We feel that it is no longer possible to remain uninvolved.

"We therefore call on scientists and engineers at MIT, and throughout the country, to unite for concerted action and leadership: Action against dangers already unleashed and leadership towards a more responsible exploitation of scientific knowledge."

Scores of institutions and thousands of scientists heeded that call. Campuses, communities, and the media carried the sense of our concern with the hypertrophy of military technology. UCS enlisted in the struggle to preserve the environment and has actively opposed, in speech and writing, such misuses of science as ABM, MIRV, and CBW.

Our efforts, joined with those of others, have had some effect but not nearly enough. The nation recognizes the festering of its environment and the inequities afflicting its citizens, but the military complex still usurps all priorities. Congress is beginning to awaken to the senselessness of the arms race, but our weaponry still expands beyond all reasonable requirements of national security. Even as Strategic Arms Limitation Talks begin, the warheads multiply to endanger the credibility of limitation and restraint.

For many, in many parts of the land, March 4, 1969, began a political commitment to a national purpose directed towards a more humane and civilized world. This year and in the future many more concerned scientists,

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FAS URGES PEACEFUL RESEARCH ROLE FOR CHEMICAL AND BIOLOGICAL WARFARE RESEARCH LABORATORIES

The Federation of American Scientists has applauded recent Administration statements promising stronger barriers against the use of poisonous chemicals and germs in warfare, but has called for several concrete actions to make these promises more meaningful. The 24-man policy-making Board of the Federation, meeting on December 28, 1969 at the Boston convocation of the AAAS, adopted unanimously several proposals presented by three of its members (Edsall and Meselson of Harvard and Galston of Yale) who have played leading rôles in alerting Congress and the public to the dangers of CBW.

John Rasmussen, Chemistry professor at Yale and chairman of the national FAS, summarized the Board's view that President Nixon's November 25 declaration of the U.S. renunciation of all forms of biological warfare and no first-use position on lethal and incapacitating chemicals makes superfluous and improper the massive secret research and production activities at such centers as Fort Detrick, Md., Edgewood Arsenal, Md., Pine Bluff, Ark. and the Rocky Mountain Arsenal. One important and constructive action would be to convert one or more of these centers into a non-secret National Testing Laboratory for screening the possible toxic, mutagenic, carcinogenic and teratogenic effects of the many agricultural chemicals, food additives, medicines, drugs and industrial substances that find their way into human bodies.

The necessity for such a federal center has recently been underscored by the recent state and federal actions limiting the rise of DDT, cyclamates and the herbicide 2,4,5-T (2,4,5-trichlorophenoxyacetic acid). The latter chemical, together with PCNB (pentachloronitrobenzen, a soil sterilant used in agriculture) have recently been found to be teratogenic, i.e., like thalidomide, they lead to abnormal development of embryos *in utero*. The wide use of 2,4,5-T in Vietnam has led the Administration to limit its use both at home and in Vietnam, but no action has yet been taken on PCNB, which is not used in war. A National Testing Center would screen out such toxic materials before they find their way into the ecosystem of which man is a part.

In a related action, the Board endorsed President Nixon's proposal to resubmit the Geneva Protocol of 1925 to the Senate for ratification. This protocol, prohibiting the use in war "of asphyxiating poisonous or other gases and of all analogous liquids" and of bacteriological methods of warfare was written and signed by the U.S., but never ratified by the U.S. Senate. The Board emphasized the importance of Senate ratification without damaging exclusions or amendments. Thus, as the U.N. General Assembly recently declared in an 80 to 3 vote, both the tear gas CS and the various herbicides used extensively by the United States in Vietnam should be included in the ban.

NEWS ITEMS

A method of making construction blocks from solid waste material has been developed in Japan. It solves a problem that plagues municipalities: how to dispose of solid wastes

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DECEMBER FAS MEETING

The FAS Council held its winter meeting on December 28 in Boston in conjunction with the AAAS meeting thus breaking a long tradition of meeting at the same time as the American Physical Society. This break is related to the attempt by the FAS over the past few years to gain more members among scientists other than physicists. The many panel discussions at the AAAS meeting devoted to problems of science and society provided a fitting background to the deliberations of the Council.

John Edsall, Matthew Meselson, and Arthur Galston led the Council discussion on CBW. The FAS was naturally gratified by the stated Nixon policy on CBW and John Rasmussen as Chairman had already written the President to this effect. Looking ahead, the FAS must be prepared to give testimony in favor of comprehensive ratification of the Geneva protocol before the expected hearings of the Senate Foreign Relations Committee. The FAS will oppose any attempt to exclude tear gases or otherwise define American limitations on the applicability of the protocol.

After a discussion of strategic weapons problems led by George Rathjens and Jeremy Stone it was generally agreed that the FAS should take action opposing a phase 2 of ABM, supporting Senator Brooke's resolution for a MIRV moratorium, and advocating a standstill on strategic weapons as the first order of business for the SALT talks in Vienna.

The question of the relation of local groups to the national FAS was a subject of a long discussion. It was felt that new groups like the Union of Concerned Scientists (UCS) in Boston should have an effective relationship with FAS and might well become chapters. It was felt also that the FAS should try to build chapters in localities where young scientists have been organizing March 4 programs or ad hoc groups. It was also realized that communications between local chapters and national FAS need to be improved.

In the expectation that the increased dues and other fund raising will make it possible the Council authorized the Executive Committee to appoint an Executive Director to start working in June. He would have as major functions working with local groups and lobbying in Washington. Several possible candidates are now under consideration.

A number of other problems from underground nuclear testing to support of basic research was considered. No short summary can do justice to the careful consideration of problems and actions that takes place at a Council meeting. Members are always welcome. The next meeting takes place in Washington at the end of April at the time of the APS meeting.

—Lincoln Wolfenstein

FAS NEWSLETTER

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Chairman John Rasmussen

The FAS Newsletter is prepared in Washington.

Editor: Judith Eckerson.

The FAS, founded in 1946, is a national organization of scientists and engineers concerned with the impact of science on national and world affairs.

Sources of information (given in the articles in parentheses) are for further reference. Items reprinted directly from other publications are designated as such in an introductory paragraph.

ANNOUNCEMENTS

The election of members of the FAS Council is to be held this spring according to the schedule of the By-laws. Nominations are invited from the membership. FAS members may nominate by petition containing the endorsing signatures of 10 members and the consent of the nominee to serve if elected.

The term of the following members will NOT expire until the spring of 1971: Dan I. Bolef, Richard A. Falk, Bernard T. Feld, Arthur W. Galston, Gerald Holton, David R. Inglis, Marvin Kalkstein, Matthew S. Meselson, George Wm. Rathjens, Arthur H. Rosenfeld, and Lincoln Wolfenstein. Louis B. Sohn has resigned from the Council.

LETTER TO THE EDITOR

Recently I picked up the November '69 issue of my husband's Newsletter and was delighted to read the editorial, "The Sorry State of Science—A Student Critique," by Allen S. Weinrub of Harvard College.

I was delighted because, though I am a woman with absolutely no formal education, I had painfully reasoned out for myself most of the points Mr. Weinrub made. I was also pleased to learn that it was a student of the "now" generation who was uttering these words of wisdom.

A few days before I had written a Letter to the Editor of *The Saturday Review* in answer to an article by Margaret Mead which implied that we had to work with and understand young people to be able to do anything about the Future as Now (or at least that it would be helpful to do this).

The point I made in my letter was that we surely need the young people and they need us, but we (the parents of today's young people) should assume *our* responsibility to end the misuse of science and technology, since we have certainly helped to perpetuate it though we might not have created it out of whole cloth. I suggested that since the military-industrial-political complex (and it is real) would be impotent without the cooperation of scientists, engineers and technicians who carry out their orders, that these professional people be the leaders, together with their foreign counterparts, in a world-wide strike against working for any more military-related projects.

It is the scientific brains and engineering know-how, plus the skill of technicians and factory workers which has enabled the U. S. to rate a shameful "first" in the art of the weaponry of destruction.

I then went on to ask all those others of us who have the conscience to realize that we are perpetuating by our inaction and apathy the expenditure of billions of dollars for non-productive, military-related industrial output and research, to contribute to a fund, the nucleus of which could be the pooled resources of the many, many world-wide organizations already working for peace. This money could be used to provide subsistence for the strikers until they could find, or create, or force governments to get to work on, in Mr. Weinrub's words, "new technology based upon corporate needs." After such assignments, they would work, I believe, *as never before*, toward the kind of world which their skill and knowledge can easily make a reality.

We have sat back too long and said, "But what can we do?" I suggest that *this* is what we can do, and that *now* is the time to do it.

Sincerely yours,

(MRS.) CLAIRE F. HULL

Shoreham, New York

NEWS ITEMS—(continued from page 1)

without causing air pollution. Developed by Tezuka Kosan Co., of Tokyo, the method involves compressing solid wastes from municipal garbage dumps into bales and further squeezing them into geometric cubes. The cubes are then wrapped in wire netting, to retain their shape, and dipped in asphalt. Other cubes have been encased in concrete or sheet steel. They are being used to form part of the foundations of buildings, as land fill, for highway construction and, in some cases, for the actual construction of commercial buildings. The new method might also be used to reclaim land now under water. Handling costs for this method are reputed to be less than that for incineration. (*The Financial Post, Toronto, 3 January 1970.*)

The United States and the Soviet Union, in spite of combined efforts, have been unable to persuade the United Nations General Assembly to endorse their joint proposal for a treaty to ban weapons of mass destruction from the ocean floor. Smaller nations complained that the large powers had failed to show regard for the interests of small nations in the wording of the treaty. (*N.Y. Times, 13 December 1970.*)

BOOK NOTES

The first Congressional hearings in more than forty years on the Geneva Protocol of 1925, which bans the first use of chemical and biological weapons, were released by the House Foreign Affairs subcommittee on National Security Policy and Scientific Developments under the title *Chemical-Biological Warfare: U.S. Policies and International Effects*. It contains testimony by 19 governments and private witnesses on the Protocol, the use of tear gas and herbicides in Vietnam, new proposals to control the spread of CBW agents, and other related issues.

The hearings, held last November and December, were conducted by the subcommittee under the chairmanship of Representative Clement J. Zablocki of Wisconsin. On November 25, one week after the subcommittee began hearings on resolutions urging the President to resubmit the Geneva Protocol to the Senate, Mr. Nixon expressed his intention to take that step. Subsequently, the subcommittee broadened the scope of its inquiry to include three objectives, according to Zablocki:

"First it sought to deepen congressional and public understanding of the considerations involved in Senate ratification of the Geneva Protocol. Second, it attempted to shed new light on other CBW issues, including the use of chemical agents in Vietnam. Third, the subcommittee examined requirements for new international agreements to control the spread and use of chemical and, particularly, biological weapons."

Among private experts testifying were Dr. Joshua Lederberg, Nobel Prize-winning Stanford University geneticist; Dr. Ivan L. Bennett, director of the New York University Medical Center; Professor George Bunn, former general counsel of the Arms Control and Disarmament Agency (ACDA); Yale biologist Dr. Arthur W. Galston; and Mr. Han Swyter, former Defense Department aide.

The printed hearings, which are indexed, also contain an appendix of documents on chemical-biological warfare, including the text of the United Nations Secretary General's 1969 report on the subject.

Copies may be obtained upon request to the House Foreign Affairs Committee, Room 2170, Rayburn House Office Building, Washington, D.C. 20515.

The Public Health Service has published a book entitled *Population Dose from X-rays U.S. 1964* (released October 1969) which gives estimates of gonad and genetically significant doses of X-rays resulting from medical and diagnostic procedures, and seeks to discover if guidelines and warnings have had an effect on the use of X-rays. The book is Public Health Service Publication No. 2001.

Another publication of the Public Health Service is available under the title *Radiation Sources in Secondary Schools*, a book which reports a limited survey of X-ray sources in public secondary schools, the largest number of which were being used for teaching purposes with little regard to safety precautions. The publication is numbered ORO 69-5, and is available from the Clearinghouse for Scientific and Technical Information, Springfield, Va. 22151.

The Salk Institute has produced a monograph by Jacques Monod, *From Biology to Ethics*, which attempts to survey the question of the relation of biological science to ethics, beginning from molecular biology and finally encompassing the human desire for intellectual discovery within the scope of the work. Monod was awarded the Nobel Prize in 1965 for his elucidation of the replication mechanism of genetic material and the manner in which cells synthesize proteins. He is Professor of Molecular Biology at the Collège de France.

SESPA CIRCULATES PLEDGE

The Scientists and Engineers for Social and Political Action (SESPA), whose membership overlaps that of FAS, have sent to our Washington office an offer of a booklet describing their anti-weapons-research-and-development pledge. The booklet contains the views of many scientists and engineers on the efficacy of the opinions favorable to the SESPA pledge, but all thoughtful and pertinent to the subject. The SESPA describes its campaign in the following news item from their December Newsletter:

We are now ready to go ahead full steam with the "no war research" pledge as a nationwide campaign. The Berkeley chapter has produced the booklet. We believe that the brief essays contained there can form the basis for some powerful educational activities directed at our professional colleagues, both in school and on the job.

It is fully realized that the statement of this pledge as we have fixed it represents a rather 'hard line' position; "I pledge that I will not participate in war research or weapons production", period. Many kind friends have tried to get us to insert qualifying conditions in order to make this pledge more easily acceptable to a larger number of people. One of the chief yardsticks we have used in trying to judge the significance of alternative wordings of the pledge is the question, "Could Edward Teller subscribe to that pledge?" The main purpose of the booklet is to stimulate people to think about the issues in some depth, even if they cannot be persuaded to sign the pledge. We hope that individual members of SESPA, and local groups all over the country will take up the task of circulating this literature and promoting the pledge. You can put these in mailboxes, hand them out at tables, in doorways, at meetings—both where you work and also at any neighboring place where scientists and engineers (of *all* kinds) may be found. You may hand them out together with a paper describing your local group and inviting more people to join you in local activities. If you find someone who strongly disagrees with the position represented by the pledge, you can organize a public meeting or debate to give the issues a healthy airing. If there is a professional meeting near home, or far away, you might arrange to pass out copies of the booklet there, and perhaps generate some discussion group around this topic. You may wish to collect locally the signatures of those individuals who subscribe to the pledge, and then perform some public ceremony connected with this group affirmation—perhaps on next March 4.

We are prepared to send out quantities of the booklet in bulk form. (The work of assembling, folding and stapling will take about ½ an hour per hundred, and a saddle stapler is best if you can borrow one.) Our cost for the printing comes to \$3 per hundred, and the mailing cost will be about \$0.20 per hundred at the special fourth class book rate (allow 1-2 weeks delivery coast-to-coast). If you are in a hurry, first class postage will cost almost \$3 per hundred. We have a few hundred dollars (donated income from services rendered to the U.S. Air Force) with which to subsidize the first several thousand copies of the booklet; so as long as this money lasts you can either pay us for copies or *ask for them free*. However we will ask people to pay for the higher postal rates if they desire faster delivery. You may of course use the booklet in your own fund raising activities any way you wish.

SEND ORDERS TO: Charles Schwartz

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RADIATION STANDARDS QUESTIONED

In a paper presented before the IEEE Nuclear Science Symposium in October, 1969, and in testimony before the Air and Water Pollution Subcommittee of the Senate Public Works Committee, two scientists from the Lawrence Radiation Laboratory at Livermore have questioned the validity of existing guidelines for radiation exposure of the general public. John W. Gofman, Director of the Bio-Medical Division and Associate Director of the Laboratory, and Arthur R. Tamplin of the Bio-Medical Division argue that the present "maximum permissible dose" of whole body ionizing radiation, set at 0.17 rads per year by the Federal Radiation Council, would permit as many as 16,000 additional cases of cancer and leukemia per year in this country, apart from any genetic effects it may produce. The radiation exposure from existing nuclear energy activities is far below the FRC limitation, but it will guide the future development of the nuclear power industry, if the present standards are maintained.

They claim that "a valid scientific justification for the allowable dose of 0.17 rads of total body exposure to ionizing radiation has never been presented." That level is equal to the background radiation of 0.10 rads and an average exposure of 70 millirads per year from medical X-rays. Gofman and Tamplin argue that radiation from manmade sources must be assessed by considering the "doubling dose," that is, the amount of radiation required to double the spontaneous rate of cancer incidence. (They believe that "the case against the perpetuation of the existing FRC Guidelines is overwhelmingly strong just on the basis of the cancer-leukemia risk, without even considering the potentially much larger problem of effects upon future generations.") Their study suggests that the doubling dose for adults for all forms of cancer is about 100 rads, or a 1% increase in incidence rate per year per rad of exposure, with considerably lower doubling doses for younger persons. The existing radiation guidelines would permit the general population to receive an integrate exposure (above background) of 5 rads between birth and 30 years of age. There would then be a 5% increase in the incidence rate for all forms of cancer plus leukemia, or, including younger people, a total of 16,000 additional cases per year. In light of these findings, Gofman and Tamplin recommend that the allowable dose be reduced by at least a factor of 10, to 0.017 rads per year for peaceful atomic energy activities.

The Atomic Energy Commission has responded to some of the points made by these authors. They argue that the doses of concern here are very small compared to those on which definitive experiments have been conducted, and that there may well be a threshold level below which cancer would not be induced. Gofman and Tamplin have argued that "to use a hope that such thresholds may exist in setting guidelines for the exposure of our population now would seem like absolute folly."

The AEC has argued that "a recommendation to lower the existing standards would appear appropriate only (1) if data have become available that were not considered by the

responsible radiation protection bodies (National Council for Radiation Protection and Measurements, Federal Radiation Council, and International Commission for Radiological Protection), or (2) if valid new interpretations and conclusions have been established through recognized scientific channels." They assert that all the pertinent information referred to by Gofman and Tamplin has been considered previously, as well as additional evidence, and they question whether there is a uniform "doubling dose" for cancer, noting the widely varying rates of cancer incidence in various countries. They have also questioned the interpretations of specific data made by Gofman and Tamplin. They conclude that "the opinions and scientifically questionable derivations of Gofman and Tamplin do not make a case for revision of radiation protection standards."

In a separate study, Dr. Tamplin has questioned the use of "maximum permissible concentrations" of radionuclides in air and water as the means of placing limits on effluents from nuclear reactors and fuel processing plants. These levels are set so that a whole-body dosage of 0.5 rad per year would result from breathing such air for one year or drinking some two liters of water per day. He argues that radionuclides actually reach man through a complex biological chain in which particular nuclides, such as Cesium 137, are concentrated in milk, fish, and other products. He suggests that the existence of such biological concentration mechanisms "serve to demonstrate quite conclusively that using air and water MPC values without considering food chains is meaningless." Tamplin argues that what is needed instead is the quantity (in curies) of each radionuclide released into the environment, so that, with physical and biological data, the distribution of these sources can be estimated.

The Gofman-Tamplin papers appear in recently released hearings of the Joint Committee on Atomic Energy, entitled "Environmental Effects of Producing Electric Power" (Govt. Printing Office, \$4.50). Other useful materials on this may be found in "Selected Materials on Environmental Effects of Procuring Electric Power," prepared by the Joint Committee on Atomic Energy (GPO, \$2.50) and "Effects of Population Growth on Natural Resources and the Environment," Hearings before the House Government Operations Committee (GPO, \$1.00).

FAS ENDORSES—(Continued from page 1)

engineers, and citizens must be engaged in a still greater effort to this purpose. At MIT we are arranging on the anniversary of March 4 a series of symposia focused on the problem of arms control; similar events will take place elsewhere.

Please join us once more on March 4th, 1970, for a day devoted to the crises of survival and to the promise of alternate courses; a day to reemphasize our commitment to harness the powers of science and technology for the service of peace and the benefit of life.

(The address of UCS is P.O. Box 289, M.I.T. Branch Station, Cambridge, Mass. 02139.)

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