

F. A. S. NEWSLETTER

Volume 20, Number 8
October, 1967

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

FAS COMMITTEE REPORT ON CLASSIFIED RESEARCH IN UNIVERSITIES

The following report, dated 4 October 1967, is by FAS Chairman Jay Orear, acting in his capacity as Chairman of the FAS Committee on Classified Research in the University. (The text of the July 28 FAS policy statement on the same subject is contained in the September 1967 NEWSLETTER.)

On July 28 the FAS statement on "Classified Research in the University" was sent to the 325 private colleges and universities listed in the 1967 World Almanac along with a covering letter from the FAS chairman. This letter requested "information on the policy and present practice of your university relating to classified research." A total of 79 replies were received to this letter. In this report we summarize the information contained in these replies along with that received from several FAS members.

A crude classification of the responses gives 37 consistent with and supporting FAS policy, 31 with no classified research and no stated policy, and 13 with varying degrees of departure from the FAS guidelines. It should be pointed out that most of the replies were from small colleges which would have difficulty obtaining classified government contracts even if they so desired. Also it should be stressed that varying amounts of information are contained in these letters and that perhaps in some of the replies crucial information has been withheld. With these shortcomings in mind, we list some of the more prominent universities which have replied.

The following universities not only have no classified research, but they either have a stated policy consistent with the FAS guidelines or else they informally endorse the FAS guidelines:

Adelphi University, Amherst College, Antioch College, Bowdoin College, Brandeis University, Brown University, Bucknell University, California Institute of Technology*, Carnegie Tech—Mellon Institute, University of California at Berkeley, Case Institute—Western Reserve, Clark University, Clarkson College of Technology, Cornell University*, University of Chicago, Harvard University, Hope College, Lehigh University, University of Miami, Oberlin College, University of Pennsylvania*, University of Pittsburgh, Rensselaer Polytechnic Institute, Tufts University, Tulane University, Temple University, Wesleyan University, Washington University, Yale University.

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FAS COUNCIL TO MEET IN CHICAGO

The next meeting of the FAS Council—to which all FAS members are invited—will be held in Chicago on January 30 and 31, 1968. As usual, this January Council meeting coincides with the American Physical Society meeting. The place and times of the Council meeting will be announced in a later NEWSLETTER.

BETHE IS NOBEL WINNER

The FAS notes with pride and satisfaction the award of the 1967 Nobel prize in physics to Hans A. Bethe, Cornell University physicist, and long-time member of the FAS Advisory Panel. The FAS as an organization, and many of its members as individuals, are deeply indebted to Professor Bethe for his wise and helpful counsel.

NEWS ITEMS

A new study indicates that the technological gap between the U.S. and other advanced Western countries will continue to widen. The study, by the Organization of Economic Cooperation and Development, finds that the U.S. spends about three times as much as all of Western Europe on research for and development of new products and processes. The U.S. has about 700,000 scientists, engineers, and technicians at work in R&D—half again as many as all of Western Europe combined. (Japan ranks second to the U.S. among non-communist countries, with 180,000 in the same occupational groups.) The U.S. now spends about 3.4% of its gross national product (GNP) on research and development; Britain is second with 2.3%. (*New York Times*; 5 October 1967)

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In a protest against U.S. policies in Vietnam, Soviet physicist Vasily Yemelyanov turned down the Atoms-for-Peace Award. Yemelyanov is best known as the long-time Soviet representative to the IAEA and the head of the Soviet Administration for the Peaceful Uses of Atomic Energy. Other recipients of this year's award—those willing to accept it—are W. Bennett Lewis of Canada, Bertram L. Goldschmidt of France, and I. I. Rabi of the U.S. The Atoms-for-Peace Awards were begun in 1955 and are financed by the Ford Foundation. They have been presented on seven occasions since their founding, and none has been given since 1963. (*New York Times*; 12 October 1967)

* * * * *

Sir John Cockcroft died on September 18th, at the age of 70. Sir John, a 1951 Nobel Prize winner, headed Britain's nuclear research establishment at Harwell after World War II and probably did more than any other man to put Britain in the forefront of the peaceful uses of nuclear energy. About ten days before his death, he had been elected president of the Pugwash Conferences, succeeding Bertrand Russell. (*New York Times*; 19 September 1967)

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The U.S. is on record as considering the exploration and use of the ocean floor comparable in importance to the exploration of space. The U.S. view was put forth by Ambassador Goldberg in the United Nations, in the context of a general agreement that the question of regulating the sea bottom should be given urgent study. Concern has recently been expressed by several small countries that, without

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OREAR LETTER TO SCIENCE ON ABM DEPLOYMENT

Following is the text of a letter to the Editor of SCIENCE from Jay Orear, who writes, in this case, as an individual and not as FAS Chairman.

Cornell University
Laboratory of Nuclear Studies
Ithaca, New York
October 18, 1967

One of the traditional responsibilities scientists have to the public is to protect it from scientific hoaxes whether large or small. A case can be made that the proposed 5 billion dollar ABM system is the most expensive scientific hoax in the history of man. It is ominous that no proponents of the "thin" ABM system have made any mention of the possibility of radar blackout by precursor high-altitude nuclear explosions. Yet in the last days of nuclear testing there was much discussion of this point and many high altitude nuclear tests were conducted by both the USSR and the USA. Much information was obtained and presumably it is now known how many explosions the Chinese will need to blackout our long-range radar. Not having access to this information, I would make an educated guess that it only takes one explosion per long-range radar station. I would then conclude that the Chinese could defeat the 5 billion dollar system by just 4 or 5 precursor explosions. (The proposed "thin" system only provides for long-range protection of cities.) The long-range part of the system could also be defeated by use of inexpensive, lightweight decoys without any "waste" of the first 4 or 5 missiles.

Perhaps an even more serious danger will be the temptation to maintain a "foolproof" defense from Chinese missiles. Our defense may be close to foolproof when the Chinese have only a few ICBMs, but at that time Chinese production will be increasing rapidly. Would not the Russians expect that there will be irresistible pressures for us to match the Chinese increase of ICBMs with a corresponding increase in our ABMs? Hence, to go ahead with deployment of any ABM system will force the Russians to plan ahead for increased ICBM production. Now that we are so close to achieving an end to the nuclear arms race, it would be a shame to throw all this away. The United States has ceased production of additional ICBMs and one would have expected the Russians to follow suit as soon as they had reached some kind of parity.

Not only should the public be warned by us that some scientific shortcomings of the proposed ABM system are being kept secret, but that such a system is very likely to start anew the nuclear arms race which had almost come to a stop in terms of numbers of delivery vehicles.

Sincerely yours,
Jay Orear

FAS NEWSLETTER

Published monthly except during July and August by the Federation of American Scientists, 2025 Eye St., N.W., Washington, D. C., 20006. Subscription price: \$2.00 per year.

Chairman Jay Orear

The FAS Newsletter is prepared in Washington.

Editor: Harriette L. Phelps.

Approx. closing date for this issue: 31 October 1967.

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.

STATEMENT FROM SEVENTEENTH PUGWASH CONFERENCE

The 17th Pugwash Conference, attended by a number of FAS members, met in Sweden in September. Following is the text of the statement issued by the Pugwash Continuing Committee after the Conference.

The Seventeenth Pugwash Conference on Science and World Affairs, marking the 10th Anniversary of the foundation of the Conferences, met in Ronneby, Sweden, from September 3-8, 1967. It was attended by about 200 participants from more than 40 countries.

The discussions showed that there was a broad and deep concern among the participants at the gravity of the world situation. Armaments multiply and their destructive power increases. There is no progress in disarmament and nuclear weapons are spreading. Radical new weapons are continually developed. Local wars break out, devastating the populations involved, and threatening escalation into major conflicts. The gap between the rich and poor countries grows wider, in nutrition, in industry, in science. Urgent and sustained efforts are necessary to avoid an impending crisis and to create the prosperous, stable and peaceful world which science has made possible.

Science and technology have brought many benefits to the world and can continue to do so in the future. But scientists must increasingly broaden their activities into still wider fields. They must put all their strength into helping to solve the many problems involved in ensuring a peaceful future. The reputation of scientists, of science itself, the future directions of our civilization, all are at stake.

It was under the spur of this sense of urgency that the 17th Pugwash Conference went about its work. To accomplish its studies the Conference divided into seven working groups and in what follows the findings of these working groups are summarized.

Problems of Disarmament

Texts of the drafts on the nuclear *non-proliferation treaty* submitted by the U.S.A. and U.S.S.R. to the 18-Nation Disarmament Conference were examined by one of the working groups. It was concluded that acceptance of a treaty based on these drafts would be a major step in preventing further proliferation of nuclear weapons and in reducing the threat of nuclear war. Completion of negotiations on the treaty, in particular the resolution of differences arising with respect to Article III, dealing with the control system, and the acceptance of the treaty by all states should be accomplished at the earliest possible date.

The group examined objections to the treaty. Although it regarded objections relating to the control system as exaggerated, it believed that it would be useful to allay such fears, as far as possible, by minimizing the intrusiveness of the inspection. For the same reason, it was suggested that it would be desirable eventually to subject the peaceful nuclear facilities of the nuclear weapons states to the same inspection as is required of the non-nuclear states. The control system of the International Atomic Energy Agency, which has already been accepted by more than 90 countries, appears to be entirely adequate for the required inspection.

Because of the very great importance of early agreement on the non-proliferation treaty, it would be a mistake to make acceptance contingent on any other specific arms control or disarmament measures. It can be expected that agreement on the non-proliferation treaty would have such a profound effect on the political climate in the world that the prospects for other arms control and disarmament measures involving the nuclear powers would be improved. It would also be very helpful if, at this time, nuclear weapon states would express their willingness at least to initiate discussions and studies of other disarmament measures that might be implemented following negotiation of the nuclear non-proliferation treaty. Some examples suggested include the following: an extension of the nuclear test ban to cover underground tests; early discussion of measures to limit and reverse the arms race in both strategic offensive and ABM defence systems; a cutoff of production and reduction of stocks of fissile materials for weapons use; the establish-

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ABM PANEL DISCUSSIONS AT AAAS MEETINGS

Of probable interest to FAS members attending the December meetings of the American Association for the Advancement of Science in New York is the following (tentative) program:

Tuesday, December 26, 2:00 P.M. — Georgian Ballroom A, Americana Hotel

"Is Defense Against Ballistic Missiles Possible?"

M. L. Goldberger, Princeton University: Moderator

Richard Garwin, IBM Watson Labs., Columbia University: ABM and the Nuclear Arms Race

Hans Bethe, Cornell University: Penetration Aids

Daniel Fink, General Electric Valley Forge Space & Missile Center: Technical Evolution of U.S. ABM Systems

Freeman Dyson, Inst. for Advanced Study: Soviet ABM Program

Wednesday, December 27, 9:00 A.M. — Georgian Ballroom A, Americana Hotel

"The Impact of Ballistic Missile Defense"

Marvin Kalkstein, State University of New York at Stony Brook: Moderator

Philip Farley, State Dept.: ABM and American Foreign Policy

D. G. Brennan, Hudson Institute: A Defense-Oriented Strategy

Leonard Rodberg, University of Maryland: Arms Control Implications of ABM

Adam Yarmolinsky, Harvard University: The Political Impact of ABM

PUGWASH CONFERENCE

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ment of nuclear free zones; and limitations on the traffic in conventional arms.

It was suggested that a useful mechanism for moving in this direction would be the undertaking of obligations by the nuclear-weapons-states not to use nuclear weapons against those states which accede to the treaty, which do not possess nuclear weapons, and which give assurance that no nuclear weapons are located on their territories.

Other Measures Towards Disarmament

In considering the problem of limiting levels of *strategic nuclear weapons*, it was concluded that the possibility of coupling limitations on ballistic missile defenses with limitations on strategic offensive systems, should be thoroughly explored with high priority.

In considering a *comprehensive test ban* it was agreed that technical capabilities now exist for extending the test ban to include testing underground, the nuclear powers should be urged to undertake negotiations to this end at the earliest possible date.

Turning from the problems of arms limitation to those of disarmament, it was noted that there has been no progress toward substantial world disarmament in recent years. A serious complication has been the repeated outbreak of local wars—often fearfully damaging in themselves. Moreover by increasing international tension and weakening international security arrangements, they make negotiations towards disarmament much more difficult. An additional serious complicating factor is that military research continues to produce new or greatly improved weapons and weapons systems. These new weapons tend to accelerate the arms race and seriously complicate the search and negotiation for agreed measures of disarmament.

A treaty to ban further research on weapons of mass destruction was proposed as meriting further study, even though the problems of negotiating and monitoring such a treaty appear formidable.

It is particularly important to take all possible measures to avoid further militarization of the oceans and outer space. Internationalization of the ocean floor, with a prohibition of all military use, is an interesting possibility. A specific suggestion was to establish, under U. N. auspices, a sonar detec-

tion network to permit world-wide monitoring of all submarines capable of launching nuclear weapons.

The development and use of new and more dangerous *chemical and biological weapons* is one of the major problems of the coming years. Scientific and technical analyses of these weapons could increase public awareness of the dangers inherent in them.

It is extremely important that all nations adhere strictly to the Geneva Protocol of 1925, which was unanimously endorsed by the U. N. in 1966. We therefore call on all nations to refrain, in any conflict between nations, from the use of any chemical and biological weapons whatsoever. We also urge vigorous efforts towards a formal treaty, to be signed by all nations, which would prohibit both the use of and the transfer to other nations of all chemical and biological weapons.

Prevention and Resolution of Conflicts

Working groups which considered these issues arrived at the following conclusions. International conflicts, even of a local character, are aggravated by the sharp division of the world into military blocs, leading to the danger of world-wide escalation of conflicts when these blocs become involved. It is therefore more and more important to stop existing conflicts and to find methods of preventing future ones. Even de-escalation of existing conflicts would be a step towards creating a better atmosphere in international relations. The United Nations should be universal and should be given an increasing role in settling and preventing international conflicts.

In Europe, in particular, all existing frontiers should be recognized. It would help European security if all states were to recognize the German Democratic Republic, with its present borders, and if both German states were admitted to the U. N., all this without prejudice to their possible future re-unification. The armaments and military budgets of both German states should be substantially reduced. All European states should sign a treaty forbidding the use of force in international relations, and should establish means for settling disputes. It is in the interests of European security that, as soon as a non-proliferation treaty is agreed upon, all European states, including both German states, ratify it.

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PUGWASH CONFERENCE

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Current conflicts in Vietnam, the Near East and Africa are causes of terrible suffering and can at any moment evolve into a world-wide thermonuclear war.

As regards *Vietnam*, it is necessary

- (a) that the bombing of North Vietnam be stopped immediately and unconditionally;
- (b) that following that cessation, negotiations for a peaceful settlement begin without delay;
- (c) subsequently a conference be convened to establish a stable peace in all of South-East Asia.

The Middle-East conflict was the object of a long discussion, but no general agreement was reached.

In the southern part of the African continent the movement towards national independence and democratic government has been retarded and has even retrogressed. While, understandably, calls at the United Nations for action are becoming more and more impassioned, there is no sign of effective action through the United Nations, or even of full implementation of U. N. resolutions. All great powers should do much more to implement U. N. principles in Africa.

Serious concern was expressed about the tragic events in Nigeria which caused thousands of deaths and millions of refugees.

International Scientific Projects

In the discussion on international scientific projects particular attention was directed to the earlier Pugwash proposal to establish an *International Science Foundation*. This would permit young scientists in the developing countries to undertake research programmes for which their countries are not able to provide. Such a Foundation would help to reduce the loss of scientists from countries for which the retention of their scientifically trained youth is vital.

An appropriate U. N. organization should consider the feasibility of establishing the International Science Foundation within the framework of the U. N.

In reviewing progress of the *International Biological Programme*, attention was directed to its satisfactory progress in the richer countries but the failure to develop it in the poorer countries, due largely to shortage of funds. Yet, for such countries, the implementation of the Programme is particularly important, and ways to obtain the necessary support must be found.

There has been important progress in international co-operation in space research, in the development of global communications by the use of satellites, in planning for a global atmospheric research programme. It was recommended that the Meteorological Programme should be developed through a co-operative organization of several autonomous centres, one of which should be located in the Southern hemisphere.

Previous recommendations were endorsed that efforts must be made to facilitate the travel of scientists to international conferences and to increase the opportunities for scientists to work temporarily in other countries.

Development, Education and Technology

The Problem of World Food Supply was discussed. More than a fifth of the population of the poorer countries of the world is living on a near starvation diet, well below their physiological needs. Limitation of the growth of populations is essential, but will be of little help in the short run. If disaster is to be avoided, immediate action is necessary to increase food supply, primarily by improvement of crop yields.

Relatively little is known about the production of essential food stuffs in the tropics. The problem is not simply one of transferring technology nor in itself exclusively technological: there are religious, economic and social factors.

Intimately linked to the problem of increased food supply is that of rapid economic development. The developed nations can greatly help here, utilizing a combination of multilateral and bilateral modes of technical assistance. There should also

be a study of methods for facilitating a transfer of technology from industrial enterprises in developed countries to similar organizations in developing countries. Intimate collaboration between scientists of developing and developed countries is essential for the success of all these programmes.

An example of a feasible and potentially very useful technical project is the creation of agro-industrial power complexes in coastal deserts or semi-desert fertile areas. These could boost regional food supplies in an unprecedented fashion and create a breakthrough in industrialization. They would be based on large nuclear reactor systems producing cheap heat energy and electric power for desalination of water and for fertilizer production. The economies of entire regions could be profoundly transformed by large projects of this sort.

The total supply of scientists and engineers is barely adequate for the needs. Furthermore, there is a large scale migration of scientists, engineers, and physicians especially from the developing to the developed countries. Forms of legal control or restriction of this migration are conceivable but were considered generally objectionable. The developing countries have a responsibility to match output of trained manpower more nearly to the needs of local development, and to make attractive working opportunities for their scientists and technologists. The developed countries ought to aim to produce more scientists than they need so that some could be available to work in other parts of the world.

A possible immediate step to help increase numbers of scientists and engineers in developing countries is to create a massive scholarship programme for students from these areas to be trained in developed countries and ultimately to be available for the many technical organizations and other tasks in their home countries.

Further recommendations include aid in the world development of technology; a study of the application of technology (satellite communication, new methods, aids, etc.) to education; and to consider means of assisting developing countries to establish well equipped international centres of research.

Social Responsibilities of Scientists and the Future of Pugwash

In the face of the dangerous conflicts now raging, and the many hard long-range problems facing mankind, scientists must increase their efforts to help in the creation of a peaceful and increasingly prosperous world. Many of the dangers facing mankind are associated with the advancement of science, and their resolution depends critically on a constructive application of science and technology. In this situation, it is an evasion of responsibility when scientists withdraw complacently into their laboratories, and are indifferent to the consequences of their discoveries and the fate of mankind.

The scientists involved in the Pugwash Movement accept these responsibilities. At this 17th Conference the participants agreed to expand the Pugwash activities, by involving more scientists, engineers, and scholars, particularly those of the younger generation, in its work. It is planned to arrange, in addition to annual general conferences, symposia for a more thorough exploration of such difficult problems as disarmament, education for life in the scientific age, and development of the technologically underdeveloped parts of the world.

NEWS ITEMS

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U.N. action, bigger powers might siege control of the sea bed which represents about 70% of the world's surface. A Maltese proposal suggests that no nation should be allowed to claim territorial rights over any part of the sea bottom beyond the continental shelf. The proposal also urges that "the net financial benefits derived from the use and exploitation of the sea bed and of the ocean floor shall be used primarily to promote the development of poor countries." (*New York Times*; 22 September 1967)

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FAS COMMITTEE REPORT

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The three with an asterisk (Cal Tech, Cornell, and Penn) have policy statements which depart from the FAS guidelines in only one respect: their policy statements would permit classified research in university owned laboratories off campus. This has been a matter of recent controversy at Cornell and Penn. It seems clear at this time that the relation between Cornell University and Cornell Aeronautical Laboratory will be changed in a significant way. Cornell's president and provost have resigned as chairman and vice chairman of the C.A.L. Board of Directors and the Cornell Board of Trustees has a committee which is scheduled to announce recommended changes by January. The letter from the Vice-Provost for Research at Penn states "Our relation to that Center (University City Science Center) is under further study at this time and we expect a clarification during the coming year."

The following institutions have no classified research at the present time and either have no stated policy, or a policy unknown to us, or a stated policy which might permit classified research:

Allegheny College, Columbia University Teachers College, Connecticut College, Drexel Institute of Technology, University of Evansville, Ithaca College, Knox College, Little Rock University, Princeton University, Reed College, Trinity College, Tuskegee Institute, Vassar College, Wheaton College, University of Bridgeport, Bethany College.

At present neither Brookhaven National Laboratory nor Lawrence Radiation Laboratory at Berkeley have classified research, although they have no policy forbidding it. Other high energy accelerator laboratories such as SLAC, CEA, the National Accelerator Laboratory, and Cornell 10 Gev Synchrotron do have policy forbidding classified research. The only exception is Argonne National Laboratory which still has a small amount of classified research in progress. A university which almost qualifies for the above category is the University of Illinois which officially discourages, but does not strictly prohibit classified research. At present it has only one classified project.

The following universities have some amount of classified research in progress either on or off campus:

Albany Medical College of Union University, Colby College, Columbia University, Johns Hopkins University, Massachusetts Institute of Technology, New York University, Penn State, Stanford University, University of Washington, University of Minnesota.

The situation is changing rapidly at some of the universities in this category. For example, the letter from Columbia University states "We have had classified research at the Electronics Research Laboratory (on-campus), but those laboratories are now being spun off as the Riverside Research Institute, a corporation in which we have no ownership." Presumably Columbia has now reached the point where it has no classified research on campus. The letter from the provost of Johns Hopkins states "We are now undertaking a reevaluation of our own views in this matter, hence it is impossible for me to send you, at the moment, a statement of university policy. . . . Meanwhile, it would be most helpful, as we struggle with this very difficult problem, to know not only your views but the results of your study." The only policy statement we have received which still permits classified theses is from M.I.T.

In the light of the rapid changes taking place, we would not recommend job-hunters to boycott the third category of universities listed above. This list is not intended to be analogous to the AAUP list of censured universities. Much more investigation and study would be needed before such a list could be prepared. It would be helpful, however, if both job-hunters and existing staff members would make inquiries as to the classified research policies of the university in question and to express their disapproval of any policy or practice which compromises freedom of discussion or criticism.

NEWS ITEMS

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New concern with the "brain drain" emanates from Britain. A comprehensive report, sponsored by the British Government, finds that two out of five new engineers and one out of five scientists are deserting Britain annually for jobs in the United States and other countries. The report notes that emigration of scientists and engineers had almost doubled to about 6200 in 1966 from 3200 in 1961. The flow to North America has quadrupled. Remedies suggested include better all-around recognition of scientists and engineers, a tax structure to permit higher salaries in industry, and a yearly review of the British Government's research and development programs. (*New York Times*; 11 and 15 October 1967.

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A new book suggests that computers pose a growing menace to privacy. The book, "Privacy and Freedom," by Prof. Alan F. Weston of Columbia University, is the product of a four-year study sponsored by the Association of the Bar of the City of New York. It is the most comprehensive study to date of the social, political, and legal aspects of privacy in relation to technological change. Weston notes that the trend toward greatly increased collection of personal data, its exchange, and its consolidation into central data banks is a serious threat to privacy in the coming decade. He urges that legal and ethical policies be developed to avoid indiscriminate use of computerized data. (*New York Times*; 17 Sept. 1967)

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In an earlier development, a group of American authorities in international law called for a United Nations study of the potential threat to individual freedom posed by computers, wire tapping, and eavesdropping devices. The call came from the Commission to Study the Organization of Peace, and was drafted by Professor (and FAS member) Louis B. Sohn, of Harvard. (*New York Times*; 5 Sept. 1967)

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Two new high energy accelerators are in operation. The Stanford linear electronic accelerator was dedicated on September 9th. The two-mile long, \$114 million machine has reached its design energy of 20 billion electron volts. (*New York Times*; 10 Sept. 1967)

A new Soviet machine, near the town of Serpukhov, south of Moscow, is reported to have accelerated protons to 76 BEV. So far, the proton current has been held to low levels. The design energy of the Soviet machine was 70 BEV. (*New York Times*; 20 October 1967)

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The space treaty came into force on October 10th, when 13 nations deposited the notices of ratification in Washington. President Johnson took advantage of the occasion to call upon Russia to help end the waste of "competitive spacemanship" by cooperating with the United States on at least some aspects of space exploration. The space treaty came into force ten years to the week after the launching of the first Sputnik in 1957. The treaty (outlined in previous NEWSLETTER) prohibits the placing of nuclear weapons or other weapons of mass destruction in orbit, on the moon, or on planets; bars all military installations on the moon and planets; forbids claims of sovereignty in space; guarantees open access to installations and vehicles on the moon and planets; and requires the return of astronauts and space vehicles that land outside their native countries. (*New York Times*; 11 October 1967)

INTERESTING READING

"The Nuclear Industry, 1967," 184 pp. report from the U.S. Atomic Energy Commission. Available from the U.S. Government Printing Office, Washington, D.C. 20402, for \$1.00. (Annual report from the AEC, oriented toward questions of interest to private industry.)

"Arms Control & Disarmament: A Quarterly Bibliography with Abstracts and Annotations," Fall 1967, 107 pp. report from the Library of Congress. Available from the Government Printing Office for 75¢ (yearly subscription is \$2.50). (About 350 abstracts, mostly of articles, indexed by author and subject.)

"Applied Science and Technological Progress," report to the House Committee on Science and Astronautics by the National Academy of Sciences, June 1967, 435 pp. Available from the Government Printing Office for \$1.50. (A sequel to the similar and well-known "Basic Research and National Goals." Prepared by the NAS Committee on Science and Public Policy, of which Harvey Brooks is Chairman. Seventeen chapters by knowledgeable authors, with introduction and summary. Essential reading for anyone concerned with current questions of the role of and funding for research in the U.S.)

"Soviet Union's 'Academic Cities' Symbolize New Efforts in Scientific Research," *New York Times*, 16 October 1967. "Soviet Genetics Reborn After Lysenko Period," *New York Times*, 17 October 1967. (Two articles in the Times series marking the 50th anniversary of the Russian revolution.)

"Scholars and Secrecy: Classified Research Comes under Criticism at More Universities," article in the *Wall Street Journal*, 25 October 1967. (Interesting article which quotes FAS Chairman Jay Orear and notes the poll—see page 1 of this NEWSLETTER—of schools by Orear's Committee.)

"Scientists and Engineers for L.B.J.: A War and Three Years Later," article by Elinor Langer, in *Science*, 29 September 1967. (The founders of the group are about equally divided: for L.B.J.; against him; and "unhappy but uncertain." Interesting discussion of issues, with many good [if understandably anonymous] quotes.)

"Chemical and Biological Warfare," a special issue (August-September, 1967) of *Scientist and Citizen*. (Essential reading for anyone interested in the subject.)

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CHEMICAL AND BIOLOGICAL WARFARE: HISTORY OF INTERNATIONAL CONTROL AND U.S. POLICY. By Robin Romero and Milton Leitenberg.

CHEMICAL WEAPONS: WHAT THEY ARE AND WHAT THEY DO. By Victor W. Sidel and Robert M. Goldwyn.

GAS IN YEMEN. By Joseph Salvia.

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FAS NEWSLETTER

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Suite 313
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Volume 20, Number 8 October, 1967

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