

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.

Controversy Grows on Atom Tests

Underground atomic tests which were held in Colorado during the first week of September, and tests which are scheduled to occur in October in Alaska, have stirred much controversy among geologists, and citizens. In August a group of citizens who owned land close to the Colorado site sued to prevent the tests, aided by the American Civil Liberties Union, on two grounds. They claimed that Fifth Amendment privileges were being violated as their property was being "taken" without due process or compensation, and that the Atomic Energy Commission Act did not provide for explosions of atomic devices by private industry. The test was conducted under the joint auspices of the Atomic Energy Commission and the Austral Oil Company of Houston in an attempt to stimulate natural gas production. Thurgood Marshall of the Supreme Court rejected the citizens' suit that the test be halted, and it occurred after 36 families had been evacuated from their home near the site.

A series of tests is expected on Amchitka Island in the Aleutian chain during October. The tests were originally moved from Nevada because of the possibility of damaging buildings around Las Vegas. It is expected that they will be the most powerful underground tests that the United States has ever made, and ecologists fear the destruction of North America's largest population of sea otter because of possible compressive damage to their lungs. Bird nesting sites may also be destroyed. The largest objections to the tests have come, however, from Alaskans who fear that the underground blasts will set off damaging earthquakes. There is also fear in Japan of such earthquakes and accompanying tidal waves. Amchitka has been a wildlife refuge for 56 years, and a small colony of the Aleutian Canada goose, which was near extinction, now nests on nearby Buldir Island.

Commissioner Frank Castigiola of the Atomic Energy Commission has told audiences in Fairbanks, Juneau, and Anchorage that he was absolutely convinced no earthquake would occur, and that he intends to be on Amchitka when the test is fired. But William A. Egan, former governor of Alaska, disagrees with him. "The proximity of the Alaska and Pacific rim permanent fault weaknesses should, I am convinced, be more than enough cause for outright cancellation of any high-violence nuclear shot," he said. Senator Mike Gravel has quoted the U.S. Geological Survey as telling him that, it considered explosion-triggered earthquakes a public health hazard. No assurances have been given that wildlife will not be affected. If a serious venting occurred at Amchitka, the consequences for the island could be disastrous. Siberia and Japan could also be affected depending on the amount of radioactivity released and the wind directions. The Atomic Energy Commission apparently has no other sites available on American soil for testing high yield weapons.

Meanwhile, in a recent issue of *Izvestia*, Dr. Mikhail A. Lavrentyev, who is head of the Siberian branch of the Academy of Sciences and chairman of the Soviet Council on the Use of Explosions in the National Economy, said that nuclear blasts used for peaceful purposes held "an important key to progress." Dr. Lavrentyev said such explosions could tap mineral resources in Siberia, clear away places for population to live, make artificial dams, prevent flooding, and aid in development of oil and gas deposits. The Defense Ministry

Pollution Crisis

During the past summer, political leaders and scientists have expressed concern over the apparently world-wide pollution of the environment, and various methods of dealing with the problem have been discussed.

In June, Secretary General U Thant of the United Nations presented a warning in the form of a report made by an advisory group working on plans for a United Nations global conference on environment, which is to be held in Sweden in 1972. Thant's report cites estimates by scientists of losses caused by various kinds of pollutants:

(1) About 1.2 billion acres of arable lands have already been lost through erosion and salination, and Soviet sources estimate that two-thirds of the world's forest area has been lost to production.

(2) Although the side effects of agricultural chemicals are not fully comprehended, a billion pounds of DDT has been released into the environment and current world production of pesticides is estimated at 1.3 billion pounds yearly.

(3) In the United States alone, technology has produced in the past year 142 million tons of smoke and noxious fumes, 7 million automobiles, 20 million tons of paper, 48 billion cans, 26 billion bottles and jars, 3 billion tons of waste rock and mill wastes, and 50 trillion gallons of hot water.

Thant stressed that the population of the world was expected to total 7 billion people by the year 2000. "The need to provide food, water, minerals, fuel, and other necessities for such increasing numbers of people will place pressures on virtually all areas of the earth and demand the most careful planning and management of natural resources. No nation can any longer be isolated from these global pressures."

At the same time that Thant's report was being made public, the governments of Germany and Holland were faced

(Continued on page 4)

LETTER TO NIXON ON CBW

On July 13, the FAS issued the following statement:

Taking note of recent remarks of the presidential press secretary and other government officials, the Executive Committee of the Federation of American Scientists yesterday sent the following open telegram to President Nixon:

Dear Mr. President: We welcome your initiative in ordering a review of U.S. policy concerning ratification of the long-standing Geneva protocol for the prohibition of gas and germ warfare. The Federation of American Scientists has long considered that U.S. ratification of the protocol would be an important step in strengthening the barriers against the proliferation and use of chemical and biological weapons. We hope that you will pursue this matter forcefully, seeking the advice of the most qualified experts, both inside and outside of government. We are confident that such a review will show it to be predominantly in the interests of the U.S. and the world for our country to join the list of nations who have long subscribed to the protocol against chemical and biological warfare.

of France announced soon thereafter that its second series of hydrogen tests would be held in the Pacific during the summer of 1970. (*New York Times*, 26 August 1969; 4 September 1969; 6 September 1969; 14 July 1969; 10 August 1969; 7 September 1969.)

ANNOUNCEMENTS

The Nominations Committee of the FAS Council would appreciate receiving suggestions from FAS members, branches, and chapters of names of possible nominees for Vice-Chairman, Secretary, Treasurer, and Council Members (for the 1970 election). Please send suggestions to D. I. Bolef, Department of Physics, Washington University, Skinker and Lindell Blvds., St. Louis, Missouri 63130.

The next meeting of the FAS Council will be held in Boston, in conjunction with the AAAS meeting, on December 26 at 10:30 a.m., 1:00 p.m. and 7:00 p.m.

The FAS Council elected (by mail) the following officers (who with ex-officio members comprise the Executive Committee): Secretary, Lincoln Wolfenstein; Treasurer, Leonard Rodberg; Member, Jeremy J. Stone; and Member, Stanley Ruby.

The following are results of the vote by the membership on the establishment of the office of Executive Director of FAS, and on an increase in the dues:

1. Executive Director: Yes 317 No 31
2. Increase in dues: Yes 276 No 64
3. No response (voted for Council positions but not questions): 125

The Society for Social Responsibility in Science has announced that its annual meeting will be held October 17 to 19 at Yale University in New Haven. The 1969 Conference Committee includes Dr. John Rasmussen representing the FAS. The program includes workshops on subjects such as ecology, chemical and biological warfare, and the military society. Representative Richard McCarthy (N.Y.) will address the meeting on "Chemical and Biological Warfare as National Policy."

NEWS ITEMS

The Atomic Energy Commission will close down and decontaminate a nuclear power plant at Elk River, Minnesota, within the next year. The reactor was built at a cost of \$22 million in 1963, and will cost \$2 million to close. AEC officials have called the plant an experiment in small-size nuclear power producers, and have found it uneconomical because of size and design. It is one of 13 nuclear power plants financed jointly by the AEC and public or private utility companies, of which 5 have been shut down. Most of the plants have utilized a first-of-a-kind design, engineering, fabrication, and construction. (*St. Paul Sunday Pioneer Press, 1 June 1969.*)

In 1958 the desert locust swarms which descended on Ethiopia ate half the wheat crop and one third of all the corn in the country. In 1961 the locust, which has consumed billions of tons of food crops in poverty-stricken areas of the world, blacked out the skies of Delhi, India, for three days. Now, after a campaign of aerial insecticide spraying sponsored by the United Nations Development Program, a network of observers in 42 countries is unable to find a single swarm of the desert locust anywhere in the world. "It's a feat comparable to wiping out the common cold," a

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Chairman John Rasmussen

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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.

United Nations official remarked. (*New York Times, 26 August 1969.*)

Officials of the Atomic Energy Commission have vigorously challenged the theory of Ernest J. Sternglass of the University of Pittsburgh that radioactive fallout has significantly increased the fetal and infant deathrate in the United States since 1950. Dr. Sternglass has advanced evidence to support the theory that genetic damage has been caused to many parents by fallout radiation, and that this has been responsible for a slowdown in the decline of the infant mortality rate. Since 1945, he has said, one per cent more baby deaths, both in infant and fetal stage, have occurred than would have been expected. He has linked increased numbers of premature births with fallout also. Dr. William Bibb of the AEC says that the results of AEC studies do not support Dr. Sternglass's theory, and that it rests on incomplete and inaccurate data. Rep. Chet Holifield, Democrat of California, chairman of the Joint Senate-House Atomic Committee, said that Dr. Sternglass's theory had already "been sharply criticized by a number of knowledgeable people who say his conclusions are based on mistaken use of data." Dr. Arthur Wolfe of the HEW Consumer Protection and Environmental Health Service said: "While Dr. Sternglass may have statistical correlations between fall-out rates and infant mortality rates, scientific evidence does not support his conclusions. The Swedish studies with mice to which he refers in support of his theory involved radiation doses several orders of magnitude higher than those possible from fallout." (*New York Times, 28 July 1969.*)

Meselson Testifies on CBW

On April 30 Dr. Matthew S. Meselson, professor of biology at Harvard University, testified at a secret hearing before the Committee on Foreign Relations of the Senate on the subject of chemical and biological warfare. A "sanitized" version of the testimony was made public on June 23, and excerpts from it follow:

I would like to make some remarks about the uncontrollability of chemical and biological warfare.

A major uncertainty in predicting or controlling the course of CBW, once it is begun, would arise from the great variety of possible weapons and targets, from the incapacitating to the highly lethal and from the local battlefield to entire continents. Once begun at any level in earnest, it would be very difficult to predict how far CBW might go. Distinctions and stopping places would be very difficult to define and to keep. The preparations and training required for one form of CBW would facilitate and therefore tempt escalation to larger scale and more deadly CBW operations. The breakdown of barriers to weapons once regarded as illegal and peculiarly uncivilized can inspire and encourage methods of warfare even more savage than those underway at the time.

The vulnerability of troops or civilians to CBW attack depends very much on the availability and effectiveness of protective facilities, the rigor of defensive training and discipline, and the performance of early-warning systems. All of this may act to place an unusually high premium on surprise or clandestine attack and on the use of novel or unexpected agents or means of dissemination. Once the effect of surprise has worn off, however, and defensive precautions have been instituted, CB warfare might continue on a large scale but with relatively inconclusive effects until new weapons are introduced or until conventions against the attack of previously inviolate targets are transgressed.

The difficulty of allowing the limited employment of gas without running the risk of bringing the whole chemical and biological arsenal into use has been concisely stated by T. C. Shelling in his book *Arms and Influence* (Yale University Press, 1966), and to quote Mr. Shelling:

"Some gas" raises complicated questions of how much, where, under what circumstances; 'no gas' is simple and unambiguous. Gas only on military personnel; gas used only by defending forces; gas only when carried by projectile; no gas without warning—a variety of limits is conceivable. . . . But there is a simplicity to 'no gas' that makes it almost

uniquely a focus for agreement when each side can only conjecture at what alternative rules the other side would propose and when failure at coordination on the first try may spoil the chances for acquiescence in any limits at all."

... Chemical and biological weapons by their very nature are suited to the attack of large areas; their natural targets are people rather than military equipment; important military personnel can be equipped and trained to use protective devices far more easily than can civilians. For all of these reasons, civilians are the most natural and most vulnerable targets for CBW attack. If the barriers against CBW are broken down, civilians are likely to become its main victims.

It is well known that some chemicals such as tear gas are able to incapacitate a man for a short time with little risk of killing. Some people have concluded from this that the introduction of non-lethal chemicals and even of biological weapons thought to be non-lethal might actually make war more humane. The argument has shown considerable appeal both for thoughtless zealots who wish to advance the practice of CBW in any form and also for persons who genuinely hope to make war less savage. Although it is true that some chemical warfare agents are relatively non-lethal in themselves, it seems to me almost certain that their use would definitely not make wars on the whole less savage and would in fact risk making them much more so, should it trigger the use of lethal CB weapons.

It is naïve to expect that in a real war non-lethal agents would be used by themselves. Once introduced into a combat area, the pressure would be very great to utilize them in any manner that increased the overall effectiveness of general military operations. Non-lethal chemical weapons would be used to increase the effectiveness of lethal ones. Tear gas can reduce the accuracy of enemy rifle fire, allowing one's own forces to approach more closely, increasing the accuracy and intensity of their counterfire. It can be used to force men out of protective cover and into the line of fire or the path of bomb and shell fragments. Under the desperate pressures of a war fought with artillery, bombs, napalm, and other lethal weapons, it is only reasonable to expect that "non-lethal" weapons once introduced will come to be used in order to kill. This has happened in Vietnam where U.S. forces have spread riot gas over large areas to force persons from protective cover to face attack by fragmentation bombs. It happened in World War I when both sides used tear gas and other non-lethal chemicals in grenades and artillery shells to facilitate conventional infantry and artillery operations.

... Chemical and biological weapons share with nuclear ones the attribute of potentially overwhelming destructiveness. Biological weapons could pose a threat to the entire human species. Both chemical and biological weapons place a high premium on clandestine and surprise attack, thus lessening stability. Once developed, chemical and biological weapons can be exceedingly cheap, relatively easy to produce, and quick to proliferate. They would threaten civilians especially. Their use would violate the oldest major arms control treaty now in force.

It is important for nations to understand that it is in their long-term interest to prevent the use of chemical and biological weapons. A relatively clear and unique standard to guide both the practice and the expectations of nations is provided by the Geneva Protocol of 1925. The Protocol has been ratified by all major powers except Japan, and, ironically, the nation which proposed it at Geneva—the United States. Many of the states organized since World II, including the People's Republic of China and both Republics of Germany, have ratified the Protocol or have agreed to be bound by the ratification of their predecessors.

... The policy of the United States with regard to the prohibition on gas has been different at different times. In 1956 the policy of the United States, as stated in "Army Field Manual 27-10," page 18, this is 1956, was as follows: "The United States is not a party to any treaty now in force that prohibits or restricts the use in warfare of toxic or non-toxic gases, of smoke or incendiary materials or of bacteri-

ological warfare. A treaty signed at Washington 6 February 1922 on behalf of the United States, the British Empire, France, Italy and Japan, contains a provision forever prohibiting the use in war of asphyxiating, poisonous, or other gases and all analogous liquids, materials or devices but that treaty was expressly conditioned to become effective only upon ratification of all the signatory powers, and not having been ratified by all the signatories has never become effective."

That was the Washington treaty. The Army Field Manual goes on to state:

"The Geneva Protocol for the prevention of the use in war of asphyxiating, poisonous, or other gases and bacteriological methods of warfare signed on 17 June 1925 on behalf of the United States and many other powers has been ratified or adhered to by and is now effective between a considerable number of states. However, the United States Senate has refrained from giving its advice and consent to the ratification of the protocol by the United States and it is accordingly not binding on this country."

A similar view was expressed by the Departments of Defense and State in 1960 in response to a joint House-Senate resolution introduced by Congressman Kastenmeier in 1959. The Department of Defense and the Department of State sent letters to the chairman of the House Committee on Foreign Affairs. The Defense Department letter dated March 29, 1960, opposes the resolution. I might say that the resolution stated that its sponsors did not oppose research and development of chemical and biological weapons, did not oppose readiness to retaliate in kind if attacked, but did wish at a time when the budget was in fact rising steeply for chemical and biological weapons, to reiterate the policy stated by President Roosevelt that the United States would not use these weapons unless it was first attacked by its enemies. The Defense Department opposed this resolution stating as follows:

"Similarly, declarations might apply with equal pertinency across the entire spectrum and no reason is conceived why biological and chemical weapons should be singled out for this distinction."

... The Department of State in its letter of opposition to the resolution stated . . . "As a member of the UN, the United States, as are all other members, committed to refrain from the use not only of biological and chemical weapons but the use of force of any kind in a manner contrary to that organization's charter. Moreover, the U.S. has continued efforts to control efforts through enforceable international disarmament agreements. Of course, we must recognize our responsibilities toward our own and the free world security. These responsibilities involve among other things, the maintenance of an adequate defensive posture across the entire weapons spectrum which will allow us to defend against acts of aggression in such a manner as the President may direct. Accordingly, the Defense Department (sic) believes the resolution should not be adopted."

... I myself do not see any sense for the United States in stockpiling biological weapons. I think we would do ourselves far more harm than good by stimulating interest in these weapons, by breaking down the barriers against them. I think we are adequately safeguarded, insofar as deterrence is functional at all, by nuclear weapons which are reliable.

... Only poor countries or underdeveloped countries, countries that do not have nuclear weapons, it seems to me, could possibly see any attraction in chemical or biological weapons as strategic deterrents.

... I think it is clear that it would not serve the interests of the United States if 10 or 20 years from now we faced a world in which the barriers against the use of chemical and biological weapons were gone and they were regarded as ordinary weapons. At all levels of hostility, I believe this would create a world in which, although the United States could perhaps outmatch all other countries, we would still be much worse off.

(The complete text of this hearing appears in printed form and can be requested from members of the Committee on Foreign Relations of the Senate.)

ABM VOTE — SMITH AMENDMENT

The FAS Newsletter prints here the results of the vote on August 6 for and against the Smith amendment, which would have prohibited the development and deployment of the "Safeguard" anti-ballistic missile system. FAS members may wish to use this information in writing to senators on further appropriation bills, in contributing money to campaign funds of senators up for reelection, in voting, and in possibly influencing further debate on the issues related to the ABM which will be raised again in Congress.

FOR DEPLOYMENT—50**Democrats—21**

Allen (Ala.)	Ervin (N.C.)	*McGee (Wyo.)
Anderson (N.M.)	*Holland (Fla.)	*Pastore (R.I.)
Bible (Nev.)	Hollings (S.C.)	Russell (Ga.)
*Byrd (Va.)	*Jackson (Wash.)	Sparkman (Ala.)
*Byrd (W. Va.)	Jordan (N.C.)	Spong (Va.)
*Dodd (Conn.)	Long (La.)	*Stennis (Miss.)
Eastland (Miss.)	McClellan (Ark.)	Talmadge (Ga.)

Republicans—29

Allott (Colo.)	*Fannin (Ariz.)	*Murphy (Calif.)
Baker (Tenn.)	*Fong (Hawaii)	Packwood (Ore.)
Bellmon (Okla.)	Goldwater (Ariz.)	*Prouty (Vt.)
Bennett (Utah)	Griffin (Mich.)	*Scott (Pa.)
Boggs (Del.)	Gurney (Fla.)	*Stevens (Alaska)
Cotton (N.H.)	Hansen (Wyo.)	Thurmond (S.C.)
Curtis (Neb.)	*Hruska (Neb.)	Tower (Tex.)
*Dirksen (Ill.)	Jordan (Idaho)	*Williams (Del.)
Dole (Kan.)	Miller (Iowa)	Young (N.D.)
Dominick (Colo.)	Mundt (S.D.)	

AGAINST DEPLOYMENT—50**Democrats—36**

Bayh (Ind.)	*Hartke (Ind.)	*Moss (Utah)
*Burdick (N.D.)	Hughes (Iowa)	*Muskie (Me.)
*Cannon (Nev.)	Inouye (Hawaii)	Nelson (Wis.)
Church (Idaho)	*Kennedy (Mass.)	Pell (R.I.)
Cranston (Calif.)	Magnuson (Wash.)	*Proxmire (Wis.)
Eagleton (Mo.)	*Mansfield (Mont.)	Randolph (W. Va.)
Ellender (La.)	*McCarthy (Minn.)	Ribicoff (Conn.)
Fullbright (Ark.)	McGovern (S.D.)	*Symington (Mo.)
*Gore (Tenn.)	McIntyre (N.H.)	*Tydings (Md.)
Gravel (Alaska)	Metcalf (Mont.)	*Williams (N.J.)
Harris (Okla.)	Mondale (Minn.)	*Yarborough (Tex.)
*Hart (Mich.)	*Montoya (N.M.)	*Young (Ohio)

Republicans—14

Aiken (Vt.)	*Goodell (N.Y.)	Percy (Ill.)
Brooke (Mass.)	Hatfield (Ore.)	Saxbe (Ohio)
Case (N.J.)	Javits (N.Y.)	Schweiker (Pa.)
Cook (Ky.)	Mathias (Md.)	Smith (Me.)
Cooper (Ky.)	Pearson (Kan.)	

* Terms expire January, 1971

** Deceased

POLLUTION CRISIS (Continued from Page 1)

with the unprecedented fish kill in the Rhine River, which destroyed millions of fish between Bingen and the sea, and

which was later traced to the dumping of insecticides into the water. That the insecticide did not harm warm-blooded animals was fortunate for the hundreds of thousands of people who depend upon the Rhine water supply.

At a meeting in London in August, Professor Barry Commoner of Washington University in St. Louis warned members of the Soil Association that the earth could become unfit for human habitation in 25 to 50 years unless steps were taken to assess and change attitudes toward the natural environment. He called the belief that man has escaped from dependence upon the rest of nature a nearly fatal illusion.

The National Academy of Sciences urged the establishment of a Federal agency to alert the nation to the perils of uncontrolled technology in a report submitted to the House Committee on Science and Astronautics late in August. As examples of the kind of dangers caused by technological changes, the report listed "the specter of thermonuclear destruction, the tensions of congested cities, the hazards of a polluted and despoiled biosphere, the expanding arsenal of techniques for the surveillance and manipulation of private thought and behavior, the alienation of those who feel excluded from power in an increasingly technical civilization." The 17-member panel which submitted the report asserted that one reason for the growth of harmful technological trends was that often those persons affected adversely had no choice in the decisions that brought about technological change. It suggested that a Federal agency could help to assure that all persons affected by technological developments could have an influence in decisions to undertake such developments.

A New York State study into air pollution control noted that air pollution is generally estimated to cost \$65 per family per year throughout the United States (costs include such things as days lost from work because of illness traced to air pollution, and extra cleaning and painting costs) but in the New York metropolitan area the cost rises to \$620 per family of four per year, and \$850 per family of four per year in some parts of New York City. The study concluded that a massive program of air pollution control would in fact result in a significant saving of money for citizens of the state.

Dr. Paul R. Ehrlich, Stanford University biologist who has written many articles on pollution of the environment, stated in an interview in Palo Alto this summer that the main task of approaching a solution to the problem of pollution is to convince the public, and other scientists, of the short time scale involved. To scientists who disdain direct political action and propagandizing, Dr. Ehrlich had an impatient response: "What am I going to do? Crawl under my professional reputation when the bombs start falling—or eat it when we get hungry?"

(New York Times, 24 June 1969; 21 August 1969; 31 August 1969; 24 June 1969; 10 August 1969.)

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