

F. A. S. NEWSLETTER

Volume 22, Number 9

November, 1969

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

CONTROVERSY OVER WISCONSIN ANTENNAS

Publicity of a Navy project which includes a huge grid of underground wires, possibly covering one third of the state of Wisconsin, caused a promise of review in the Defense Department. Officials said, however, that while "Project Sanguine" was under review, it would continue unchanged for the present time. Deputy Secretary of Defense, David Packard, seemed concerned mainly for the budget of the project.

Project Sanguine is to be a huge backup nuclear "button" buried in the forest floor in case other communications are knocked out by enemy H-bombs. The button would take the form of a huge grid, covering thousands of square miles, which would produce the longest radio waves ever generated by man, signals intended to reach Polaris submarines hidden in the ocean depths. The Sanguine signal could order the subs to fire missiles.

Conservationists, biologists, and others are worried that the timber, trout streams, animals and plants will be hurt or killed by the electric currents which the Navy admits will leak out of the Sanguine system. Senator Gaylord Nelson (D., Wis.) has said that the Congress has never investigated the project to establish whether it is needed. He estimates that its eventual cost will be \$2 billion. He said also that the network will give off electrical currents that will affect some 26 counties: thousands of miles of Wisconsin farm and forest will be dug up to install some 6,000 miles of cable under the ground over a 25,000 square mile area. "There has been no debate in Congress to prove that, even if the system will work, it is a necessary or a justifiable expense." The Navy has explained the project to people in Wisconsin, stating that, "the purpose of the test facility is not to demonstrate the feasibility or the effectiveness of the communications technique involved. That has already been demonstrated. But before such a facility is constructed we are going to show you, not tell you, that the facility will not adversely affect the area." The Navy has built what it calls an "interference mitigation laboratory" to keep electrical currents from Sanguine from disrupting the area.

The digging and building are regarded by residents as a boon in the form of jobs, but there are others who worry that the project could make Wisconsin a prime target for enemy H-bombs. Navy leaders concede Sanguine could become a target but doubt the spread out system would ever be a prime one. The existing command and control centers for launching American ICBMs are considered prime targets. Weapons experts have feared that nuclear effects in a war would black out those systems.

The main focus of the controversy now is over the effects on Wisconsin's countryside. The antenna now in existence consists of two fourteen-mile long stretches of wires which intersect at the middle to form a cross. There is a transmitter at the intersection. The plan is to duplicate this cross until the Laurentian Shield in upper Wisconsin is entirely covered. The rock of the Laurentian Shield is about two billion years old and extremely dry. The dryness serves as an aid in insulating the antenna. The electrical current would not be drawn off deep into the earth at those places where the system is grounded.

To answer objections from conservationists the Navy has

(Continued on page 3)

U.N. REPORT CORRELATES RADIATION & RETARDATION

The following article appeared in the N.Y. Times on 12 October 1969. The author is Kathleen Teltsch.

A panel of 15 scientists warned in a United Nations report today that even low doses of radiation on pregnant women might possibly result in mental retardation of the unborn.

The warning was given by a group of radiologists and other specialists serving on a scientific committee created by the General Assembly in 1955 to examine and report on the effect of atomic radiation.

The United States member of the panel was Dr. R. H. Chamberlain, a professor of radiology at the University of Pennsylvania.

The conclusions were based in large measure on recent studies made of children born to women who survived the bomb blasts at Hiroshima and Nagasaki. These studies were made by the Atomic Bomb Casualty Commission, supported by the United States and Japanese governments.

In their report, the scientists noted that there was clear evidence that high radiation doses, such as those experienced by pregnant women who survived the Hiroshima and Nagasaki bombings, could result in mentally retarded offspring.

Evidence of the effects of low doses is still "extremely tenuous," the specialists said, but they cautioned that low-range radiation could not be excluded as causing some damaging effects. As a group, they called for more intensive study of the matter.

The specialists define low doses as up to 50 rads and high doses as 50 rads or above . . .

The average diagnostic X-ray would be in the magnitude of one rad or less, and improvement in radiology techniques has permitted a steady reduction in the energy required, further cutting down on doses.

Although the experts' report, as usual, will be given to the 126-member Special Political Committee of the Assembly, the medical aspects are clearly directed at the scientific community of each state in the hope that the report will promote studies of low-dose radiation effects.

Much of the scientific data gathered in the Hiroshima and Nagasaki studies has been available in medical circles, United Nations sources said, but the results of the follow-up studies on the children at the age of 20 have not been widely circulated and until now the material has not been presented so boldly.

The studies covered 1,613 children, or about 16 percent of those born alive after having been conceived at the time of the atomic blasts.

Of the pregnant women who suffered doses of 200 rads or more, 36 per cent of the children were mentally retarded. Of those who suffered 100 to 200 rads, 9.30 per cent of the offspring were retarded and for women receiving 50 to 99 rads, the level of retardation dropped to 4.55 per cent.

Lower radiation doses resulted in a considerably smaller number of retarded youngsters. For 500 women who were not

(Continued on page 4)

BOOK NOTES

"The poisoned air, polluted water, unworkable and dangerous transport systems, erosion of public amenity and public services, and turbulence and uncertainty in the institutions which traditionally have provided relief and redress are signs of the times. It is my view that there is nothing inevitable about these conditions. The environment can be designed and does not have to be left to adventitious circumstances." This is the opinion of Richard P. Dober, in the preface of his book, *Environmental Design*, published by Van Nostrand Reinhold. The environment of which he speaks is largely urban. The book has 274 pages (8½ x 11) and 260 illustrations. \$18.50.

The *SIPRI Yearbook of World Armaments and Disarmament* (published by Almqvist & Wiksell, Stockholm, Sweden) is available from the Humanities Press Inc., 303 Park Avenue South, New York, N.Y. 10010, at approximately \$12. (60 Swedish kroner). The book attempts to provide a comprehensive picture of armament in the world. Of particular interest may be the special study of the strategic competition between the two great powers and the arms trade with developing countries. Estimates of the value of the trade in major weapons are published. There is also a large section on the history of disarmament efforts. The League of Nations published two yearbooks of this type. This is the first of its kind since those efforts of forty years ago.

Documents on Disarmament—1968 has been released by the Arms Control and Disarmament Agency, and is purchasable from the U.S. Government Printing Office at a price of \$3.75. It is the latest in a series of annual compilations of disarmament statements by the agency and by public officials. It includes speeches made at the U.N. and official statements made at the 18-Nation Disarmament Conference.

Selected Materials on Environmental Effects of Producing Electric Power, also available from the U.S. Government Printing Office, for \$2.50, is a collection of sources and testimony on environmental problems caused by the production of electric power by atomic power and by conventional means.

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 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 date of the December FAS Council Meeting has been changed from the 26th to December 28, 1969 at 1:30 P.M. The meeting will be held in the Back Bay Room of the Sheraton Plaza Hotel, in Boston.

FAS members may find one or more of the following symposia of interest. They will be held at the Annual Meeting of the AAAS in Boston, during the period 26-31 December.

There will be nine programs under the heading of *Hunger, Food, and Malnutrition*.

Under the heading *The Earth, the Solar System, and the Cosmos*, there will be a program "Changes in the Environment of the Planet Earth," on 29 December. This is arranged by Louis Battan (University of Arizona, Tucson), Edward Lorenz (M.I.T.), and Philip Thompson (National Center for Atmospheric Research, Boulder).

"Is There an Optimum Level of Population," will be held on 29-30 December, and is included in the *Health, Disease and Behavior* programs. It is arranged by S. Fred Singer (U.S. Department of the Interior).

Under *Social and Political Interactions* there are several programs of interest to FAS members. "Arms Control and Disarmament" which will be held on 26-27 December has been arranged by Daniel M. Singer of the FAS and Herman Feshbach (M.I.T.). "Science and Public Policy Workshop" will meet on 29 December, arranged by Harvey Sapolsky. "Military Support of Academic Research" will meet on 29-30 December. It is arranged by Walter Modell (Cornell University Medical College, New York City). "State Science Policy" will meet 30 December, arranged by Frank Hersman (National Science Foundation) and Thomas G. Fox (Governor's Science Adviser, Commonwealth of Pennsylvania).

Under the rubric *Ethics, Morals, Philosophy, and History* there will be a symposium on "The State of Science—A Student Critique" on 28-29 December. It is arranged by Allen S. Weinrub, a student at Harvard University and a member of FAS. "Science and the Future of Man" will meet also 28-29 December, arranged by R. L. Carovillano and James W. Skehan, S.J. (Boston College).

"Sea-Level Panama Canal: Marine Biological Effects," will meet 30 December, as arranged by J. C. Briggs (University of South Florida, Tampa). This symposium is in the *Life and the Living Earth* division.

In the *Affairs of Technology, Economics, and Business* group, there will be a program on "Power Generation and Environmental Change" on 28 December, arranged by David A. Berkowitz (Mitre Corporation, Bedford, Mass.) and J.P. Ruina (M.I.T.).

These suggestions are selected from more than 125 programs which have been scheduled for the AAAS meeting.

The FAS office in Washington is now actively seeking an Executive Director. Any suggestions or applications should be directed to the Treasurer, Leonard Rodberg.

WISCONSIN ANTENNAS—Continued

(Continued from page 1)

awarded a contract to Hazleton Laboratories of Falls Church, Virginia, to assess such dangers. Kent D. Schiffert, a history instructor at Northland College in Ashland, Wisconsin, said "the whole Hazleton contract is a smokescreen to quiet the conservationists." He said Hazleton is too heavily dependent of military work to do an objective analysis and that the study contemplated will not cover enough of the animals and plants in the range of Sanguine's currents.

Lowell Klessig, an environmental science specialist, active in the Stop Sanguine committee, said, "Every biologist knows that the nervous system and other biological processes operate on the principle of internal electrical fields. To put an organism in an external electrical field, such as is proposed by the Navy in Sanguine, may very well alter these processes . . . The electromagnetic field may even influence the guidance system of migratory birds, such as ducks and geese, and cause them to lose or change their fly-way patterns."

In its proposal for the study, Hazleton Laboratories noted: "It has been shown that there can be pronounced effects on the longevity, body weight, growth, behavior, central nervous system, reproduction, etc., in animals as well as effects on plant development from ultrahigh frequencies." In the low frequency ranges, the proposal added, little work has been done, although "there may be some effect on sperm production," according to a study done in 1967. The Hazleton proposal also noted that, "the antenna will be enormous and, therefore, many people, domestic and farm animals, fish, insects, earthworms, birds and indigenous plant life will all be exposed to its fields for very long periods of time unless they are killed by it, are removed, or, in the case of free-ranging animals, are driven out by noxious effects. Of course, it may be that the fields will be totally benign."

(*N.Y. Times*, 14 October 1969, 25 October 1969; *The Washington Post*, 12 October 1969.)

U.S. AND SOVIET UNION AMEND TREATY

The United States and the Soviet Union have agreed to make modifications in the proposed treaty to ban nuclear weapons from the ocean floor. Some of the changes are minor, but both delegations hope to make the treaty more acceptable to non-nuclear nations. The revised draft includes the following changes:

(1) It will restore the provision for a review conference, to be held five years after the treaty goes into effect, to consider changes in the light of the treaty's operations. This was previously in the draft treaty and dropped.

(2) The article giving nuclear parties to the treaty a veto over future amendments will be deleted.

(3) Clarifying language will be inserted to close at least a theoretical gap in the prohibition of nuclear weapons and other weapons of mass destruction. These would be barred only outside a 12-mile coastal limit, whereas the territorial waters of the United States, Britain and several other coastal states extend only to the three-mile limit. Some delegates have contended that this would permit any country to station nuclear weapons in the nine-mile gap, and the two nuclear powers will correct this oversight.

(4) A new article will permit a party to the treaty to take disputes over verification to the United Nations Security Council.

(5) A new article in the preamble will contain an assurance that the treaty will not alter existing rights of coastal states.

(*N.Y. Times*, 24 October 1969.)

ARGENTINA PLANS NUCLEAR WEAPONS DEVELOPMENT

The following article, by Walter Sullivan, appeared in the N.Y. Times of 27 October 1969.

Scientists attending the 12th annual Pugwash Conference have heard that Argentina appears to be developing the ability to produce nuclear weapons.

The Argentines, it was said, are mobilizing their physicists to make possible this achievement with[in] perhaps 10 to 15 years. By 1972, according to the report, Argentina will have a 316 megawatt reactor capable of producing plutonium usable in nuclear weapons.

Unless Argentina agrees to allow inspection of its plant by the International Atomic Energy Agency, there will be no check on the diversion of plutonium to weapons production.

Scientists from 30 nations gathered here this week to explore ways to stem the nuclear arms race, but they listened instead to this report on a potential new member of the nuclear weapons community.

Among the 15 Americans taking part are Eugene Rabinowitch, editor of the *Bulletin of Atomic Scientists*; Franklin A. Long, a Cornell University chemist; Bernard Feld, a physicist of the Massachusetts Institute of Technology; Paul M. Doty, Jr., a Harvard chemist; Marshall Shulman, director of the Russian Institute at Columbia University, and Albert Wohlstetter, a military strategist.

The Argentine developments were reported by a specialist associated with international efforts to avert the spread of nuclear weapons. Under the rules of the conference, however, he cannot be identified.

The conference rules are intended to encourage candor and to allow participants to make unorthodox proposals without committing themselves or their governments.

The specialist who reported on the Argentine nuclear development said the government was motivated by fear that a revolution in Brazil might some day endanger the security of Argentina.

Neither Argentina nor Brazil has signed the treaty to ban a spread of nuclear weapons. Both are among the industrial countries that are suspicious of nuclear limitation pacts in the belief that they restrict opportunities for peaceful research as well as weapons development.

The mood of the meeting at this Black Sea resort is somber. Some of the more candid speakers from East as well as West have conceded that the arms race has a "lift of its own by being tied toward ever more complex and costly systems through its own momentum rather than by independent political decisions.

Specialists on one side, it was said, feel challenged by a new development on the other side. They resort to what strategists call "a worst plausible case analysis," which invariably makes the actions of the other side seem more threatening than they really are. The analysts then recommend a course that represents an overreaction.

Argentina awarded a \$70 million contract last year to a West German company to build a nuclear power plant, scheduled to begin operation by June 15, 1972. Construction is already well advanced.

Elements of nationalism were involved in the decision to award the contract to Siemens A.G. Both Westinghouse and General Electric submitted lower bids, but both would have built plants reliant on the United States for enriched uranium fuel.

Argentina wished to exploit her own resources of uranium. The plant is being built at Attucha on the Parana River, 60 miles northwest of Buenos Aires.

THE SORRY STATE OF SCIENCE— A STUDENT CRITIQUE

(See Announcements, page 2)

Lee DuBridge and the National Science Foundation, among others, have applauded the great contributions science has made to the welfare of mankind. Their rhetoric, however, is based upon an overly optimistic assessment of the results of scientific and technical advance. A more realistic view, while noting advances in the comfort and health of certain peoples, would recognize as well the growing disparity in the distribution of man's wealth, accompanied by the planned waste and destruction of goods which millions of people need. It would take account of the daily use of ever more sophisticated weapons and the threat posed to the survival of mankind by thermonuclear war. It would note the growing manipulation of men's thoughts and behavior by those who use the new surveillance and information handling techniques to control an increasingly complex technological society. And it would point to the hazards of a polluted and despoiled environment amidst a steadily burgeoning population.

These threatening conditions are the results of continued technological growth. But science has always held forth the possibility of freeing mankind from the forces of nature and social oppression. To understand why tremendous technical advance has not only failed to resolve basic social problems, but rather worsened them, it is necessary to consider the social and economic context in which technological innovation occurs. Who develops new technology, who uses it and how, and who benefits from its use?

In an effort to explore these questions a group of Harvard and MIT graduate students is preparing a symposium on the Sorry State of Science. These students' concern over the misuse of science and technology was spurred by last spring's March 4 research stoppage at MIT. It was with the encouragement of the AAAS that they have assembled to prepare this program.

The first session of the two part symposium will provide an analysis of the social and economic framework of technological innovation. Several case studies will be offered in support of the thesis presented. The second session will focus attention on the role of scientists and engineers in relation to the misuse of their work and abilities. The session will also explore approaches, consistent with the analysis presented, that can be taken towards directing the application of science to social needs and human welfare.

In the American economy, technology is developed by large corporations and the federal government for the benefit of big business. That is to say that the interests of corporate enterprise, i.e., longevity and long range profitability, are the criteria upon which decisions to exploit new technical advances are made. The misuse of science and technology is intimately related to the promotion of corporate self-interest in a political environment characterized by the absence of social control.

In fact, the development of new technology based on corporate needs is in direct conflict with the best interests of society in the following ways:

- 1) Military technology is developed for war and counter-insurgency to protect corporate economic interests and to suppress popular movements throughout the world.
- 2) Technology is utilized to increase production efficiency, but automation and pollution are introduced without regard to the retraining of workers or the fouling of the environment.
- 3) Technology is used to guarantee mass consumption. Designed obsolescence coupled with marketing and communication technology guarantee large markets for

low quality consumer goods, and result in a tremendous waste of resources.

- 4) Innovation is suppressed or fails to respond to social needs because the sole criteria for the assessment of new technology are corporate interests.
- 5) New technologies are developed at great public expense only to be used to further private interests.

These points will be developed in more detail by case studies presented during the first session of the symposium: Steve Cavrak will describe the designed obsolescence of computers and will show that market criteria rather than engineering criteria govern technical change; another speaker will demonstrate how research in the social sciences is not politically neutral and will describe which interests are served by the emergence of new social science techniques; Larry Beeferman will present an analysis of the dynamics of the innovative process; Steve Kaiser will analyze the NASA program to discover who benefits from the large government expenditure in space technology; and Rick Paul will describe how research and priorities in the pharmaceutical drug industry are not directed to improving the health of society.

Essential to technological innovation are the scientists and engineers who make technical advance possible. Larry Beeferman will show how the prevailing concept of a technological class, one characterized by a certain training and life style, is not relevant to an understanding of the misuse of science and technology. He will discuss, rather the important relationship of technically trained people to technological development and to production, and he will explain as well the role and interests served by the University in technical advance. David Guttman will investigate the part played by weapon technologists at the university, especially with regard to the genesis of new technical concepts and the determination of the purposes for which they are to be employed.

The aim of this symposium however is to go beyond an understanding of the social and economic framework of technological change and the role played by the technologist in that process. It is to evaluate and formulate proposals for bringing an end to the misuse of science and technology. The analysis presented, for example, would rule out a solution like the development of increased technological sophistication because it represents a technical approach to a non-technical problem. Proposals will be made instead for political action consistent with the analysis presented in the symposium. It is only through programs of this nature that scientists and engineers, and the society as a whole, can put an end to the perversion of science.

—Allen S. Weinrub

U.N. REPORT—Continued

(Continued from page 1)

at home in either city at the home of the blasts, the rate of retarded birth was less than 1 per cent.

The report also noted that reduced head sizes were observed[d] at more than the normal rate among those children who had been exposed to radiation in the second to sixth month of intrauterine life.

The risk of mental retardation is much higher during these months of [pregnancy] . . .

The scientists also noted that retardation was not the only serious effect associated with prenatal radiation and cited surveys showing that children exposed to radiation in early childhood had a 40 per cent higher incidence of malignancies of the central nervous system.

In its overall conclusion, the report said:

"The evidence available induces the committee to draw attention to the particular hazards that may result from irradiation of the fetus and of children." . . .

NEWS ITEMS

The State of New Jersey has charged nine airlines with polluting the state's air. Representatives of the airlines must answer the charges in Superior Court in December. (*N.Y. Times*, 22 November 1969.)

The government of British Columbia has launched a program to save the falcon from extinction in its last North American refuge, the Queen Charlotte Islands. Permits which were formerly issued to the public for the capture of falcons have been withdrawn, and a study has begun on the effects of human activity on long-term population trends. Insecticides have been held responsible for the disappearance of the falcon from most of North America. Even in the Yukon and Northwest Territories, falcons have been unable to breed. Their migrations take them to farmlands in the south of the United States, where they feed on smaller birds and mammals infected with DDT. (*The Washington Post*, 26 September 1969.)

The water-pollution control industry is now selling \$800 million worth of equipment and construction services annually, which is below the \$2 billion market expected in 1970. Federal agencies predicted that the industry would grow to \$29 billion annually, after enactment of the 1965 water legislation, but there has been very little enforcement of the bill by the Department of the Interior. The government itself has spent less than one third of the \$700 million that Congress authorized for water pollution control programs. Construction of new municipal sewage systems has also been curtailed by the weak municipal bond market and resistance to new taxes. Water-pollution control industry spokesmen say that a large part of the pollution control equipment sold to factories today is used to clean incoming rather than outgoing water. (*Business Week*, 4 October 1969.)

The Department of Health, Education and Welfare has announced the formation of a committee to examine the department's security apparatus as well as blacklisting complaints by scientists. The panel will be headed by John G. Veneman, Jr., a departmental under-secretary. (*N.Y. Times*, 10 October 1969.)

Florida's governor, Claude R. Kirk, has given help to several private companies, which are exploring methods of shrimp farming, by signing a law which allows shrimp to be farmed in public waters. Cultivation of pompano, oysters, catfish, and other fish crops are planned. It is hoped that methods will be found to expand the water-farming techniques to more varieties. (*Business Week*, 20 September 1969.)

The Department of the Interior, Bureau of Mines, has awarded seven new grants for research on the economic recovery of mineral and fuel values now lost in city refuse. One project will be aimed at recovering the gaseous fuel resulting from the decomposition of garbage, paper, and other decomposable waste. Another will study the technical aspects of using waste glass for making strong, lightweight, building material. Crushed glass as a component of roads and airport runways is also under study. (*Bureau of Mines news release*, 30 October 1969.)

The American Friends Service Committee has organized a new group called *National Action/Research on the Military / Industrial Complex*. The group plans to collect information on the activities of the military/industrial complex and publicize it, and guide action in opposition to it. The address of the organization is 160 North 15th St., Philadelphia, Pennsylvania 19102. For those who are interested, the *Friends Committee on National Legislation* provides a list of the "Hundred Biggest Pentagon Contractors," for 1¢ each. Their address is 245 Second St., N.E., Washington, D.C. 20002.

The number of illiterates in the world has risen by almost 60 million to about 800 million, in this decade, according to a United Nations official. The estimate has been made after a study of more than 90 countries. High birthrates have been named as the main cause, outstripping the expansion of educational programs in underdeveloped countries. The estimate of illiterates is between 30.5 and 34.8 per cent of the total population of the earth. (*N.Y. Times*, 19 October 1969.)

The foreign minister of Iceland, Emil Jonsson, has said that the fish population of the North Atlantic is diminishing because of sea pollution, most of it caused by oil leaks. He said, "while the human race has embarked upon adventurous journeys into outer space, it is time to put our own house in order and decide upon an effective and just regime for the suboceanic areas, whose resources must be harvested for the benefit of all mankind." (*N.Y. Times*, 14 October 1969.)

A West German firm may have a partial solution to oil pollution. A plastic foam originally developed for farm use to absorb and retain water content in soils was tested for its oil absorbing properties after 2,000 gallons of diesel oil had spilled into a swimming pool. The foam was spread over the water to soak up the oil. The water was clear when the oil-filled foam was pumped out. (*Financial Post, Toronto*, 25 October 1969.)

The Joint Committee on Mental Health of Children has reported to Congress that almost 10 million Americans under 25 years of age need help from mental health workers and are not getting it. They said that mental health care for children had "worsened considerably" in the last 40 years. (*N.Y. Times*, 26 October 1969.)

President Nixon has said that the development of the supersonic transport must be continued if the United States is to maintain its world leadership in air transport. The President stated flatly at a news briefing this morning that "the SST is going to be built." Administration officials then outlined their appeal to Congress for \$662 million more to build two test models of the 1,800-mile-an-hour jet aircraft. (*N.Y. Times*, 24 September 1969.)

A Long Island woman has sued eight chemical companies in Federal Court for \$30 billion in damages, charging that they, the principal manufacturers and distributors of DDT, had caused widespread damage to the natural resources of the United States. If the suit were won, the money would go to municipal, state, and Federal governments, the plaintiff indicated. "The defendants," the suit alleged, "acting . . .

NEWS ITEMS—Continued

through the agency of the Industry Task Force for DDT of the National Agricultural Chemicals Association have taken action to prevent the widespread distribution and evaluation of scientific data . . ." (*N.Y. Times*, 15 October 1969.)

Thirty thousand people in Mississippi, including Senator James O. Eastland, were evacuated from their homes on September 12 because of the threat of poison gas liberated by a train derailment. Four tank cars containing vinyl chloride, which gives off deadly phosgene gas when heated, were involved in the derailment, and later exploded and burned. Experts disagreed on the extent of the danger, particularly on the point whether vinyl chloride forms large amounts of phosgene when burning freely in air, but there was agreement that the secrecy surrounding the train's cargo was deplorable. Eleven towns were evacuated. The Defense Department disclaimed any involvement, and the House Government Operations Subcommittee planned an investigation of the derailment. (*N.Y. Times*, 13 September 1969.)

Eldrige G. Hunt, of the pesticide investigations project of the California Game Commission, speaking at Oregon State University during a symposium on the biological effects of pesticides in the environment, said that eleven major fish kills in California during the last five years have been attributed to pesticides in irrigation drainage water. The fish kills he spoke of ranged from "1000 fish to more than we could count." Low levels of pesticides, particularly DDT, he said, were doing harm to fish and bird life, although other forms of pollution might be responsible for even more deaths. He pointed out that sub-lethal effects might be of even greater concern. Some predators, he said, died from eating fish which had become resistant to the effects of pesticides. (*N.Y. Times*, 20 August 1969.)

SPACE RETURNS TRIVIAL

The following letter appeared in the N.Y. Times of 26 September 1969.

To the Editor:

The triviality of the scientific returns from the man-on-the-moon program is finally becoming evident even to those—mostly scientists—who had been misled by publicity and by the play on popular imagination indulged in by Government and the mass media.

The moon rock samples, about which full columns of news are released by NASA, cannot even answer the few questions some geologists are interested in solving.

It is important that this be made clear because of the current discussion about big versus small Mars-landing programs—probably \$3 billion a year for fifty years or \$10 billion a year for fifteen years. This at a time when the Institute of General Medical Sciences of the National Institutes of Health has announced substantial cuts in new health-related research projects, news that has received much less prominence than any of the rock-news from NASA.

Even apart from the social benefits that American health research has been in the habit of delivering, such as polio, measles and flu vaccines and a hundred other medical advances, almost any one of the hundreds of projects that the National Institutes of Health cannot fund has intrinsic scientific interest at least as great as a trip to the moon—in terms of the number of intelligently concerned people and addition to human knowledge.

Technology, however sophisticated, is not science unless its goal is knowledge. Intellectual priorities are at least as important for human culture as socio-economic priorities, and both are being distorted by the space program.

It is time the American people were told frankly that the present space program is technically impressive, scientifically trivial, culturally misguided and socially preposterous.

S. E. LURIA, M.D.
Cambridge, Mass., Sept. 17, 1969

The writer, professor of biology at M.I.T., is a member of the National Academy of Sciences.

FAS NEWSLETTER

Federation of American Scientists
Suite 313
2025 Eye Street, N. W.
Washington, D. C. 20006

Volume 22, Number 9 November, 1969

Second Class Postage
Paid at
Washington, D. C.

Return Postage
Guaranteed