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

FAS STATEMENT ON GAS IN VIETNAM—Page 4

Etzioni Speaks on ACDA Budget

The Institute of War and Peace Studies of Columbia University has released a statement by Amitai Etzioni, which was part of testimony before the Senate Foreign Relations Committee on February 23. The Committee was in session to consider the Arms Control and Disarmament Agency budget, and later recommended a two-year allocation of \$20 million. The statement is here abridged.

The need for an agency devoted to arms control and disarmament could not be more manifest in an age of big bombs on what has proved to be a small planet. The formation of ACDA is an expression of concern for peace and disarmament almost unmatched by other nations. Much of the work of ACDA has been outstanding—e.g., its contributions to the formation of the "hot line," the partial test ban treaty, and the Geneva negotiations.

The research conducted by ACDA, however, was never given the funds needed to serve Congress; it never had the facilities to provide the capacity spelled out in the 1961 act: "This organization must have the capacity to provide the essential scientific, economic, political, military, psychological, and technological information upon which realistic arms control and disarmament must be based." The absence of any significant contribution by ACDA to our understanding of the recent crisis in Vietnam illustrates this. Much of ACDA's research funds is committed to studying ways and means of curbing the danger of a nuclear war between the United States and the Soviet Union, leaving inadequate funds for studies on curbing armed clashes on a small scale. These small-scale confrontations, however, are frequent, and they might escalate into major wars.

On neutralization: One of ACDA's central functions could be to compare so-called common sense with the findings of scientific research. For instance, many American leaders and citizens are mistrustful of any neutrality plan. It is widely believed that neutrality exposes a country to subjugation by totalitarian powers who disregard neutrality, as when the Nazi forces occupied Denmark and Holland.

Actually, there are two very different kinds of neutrality. One serves as a cover for surrender; it occurs when great powers confront each other and one retreats, leaving an ally defenseless. The second type of neutralization is achieved by agreement between all the powers concerned and is enforced by their combined might. All the powers involved are committed not only to stay out of a given territory, but also to re-enter it if any one of them violates the independence of the neutralized country.

The record shows that such *power-backed neutralization does not open the door to Communism but has served to bring liberty to subjugated people.* These countries also serve as effective roadblocks to further expansion. The only instance since 1946 in which Communist troops retreated significantly and released a major part of a country that was in their hands to the institutions of a free society was achieved not through an act of war, bombing, or counter-insurgency, but through power-backed neutralization. After hundreds of rounds of negotiations between the East and the West, after most experts believed that nothing would be achieved, an

(Continued on page 3)

India's Dilemma and a Statement From FAS

The following article by Howard Margolis explains the problem which India faces in maintaining its decision not to attempt to become a nuclear power. It appeared in the Washington Post of March 4, 1965. The Federation of American Scientists' Statement on Non-Proliferation, which comments directly on this problem of India, is presented at the end of the article.

The Indian government is in the unenviable position of being the most outspokenly anti-nuclear of the major nations and at the same time being under the heaviest pressure to develop its own nuclear weapons.

As a result of an extensive peaceful atomic energy program, India has acquired a relatively cheap option to build its own Nuclear bomb.

The government of Prime Minister Shastri is now being pushed hard to exercise that option as a consequence of the Chinese border war in 1963 and the Chinese nuclear detonation last fall.

Whether it does so or not will have a good deal to do with the success of the effort, strongly supported by the United States, to slow the spread of nuclear weapons to new nations.

India—at least the elements in India, including Shastri, who are resisting these pressures—are looking abroad for support against domestic critics. What they are looking for is some form of assurance that their restraint will not leave India wide open to nuclear blackmail from China.

But the form of such guarantees poses problems both for the Indian government and for the guarantors, who must be drawn from the present nuclear powers. For example, a guarantee that came solely from the United States—or solely from the Soviet Union—would compromise Indian neutrality, and the pro-nuclear forces in India would argue that it would be better for India to develop its own bomb than to become allied with one side or the other in the cold war.

Presumably what the Indians would like best—at least what they have been hinting they would like—is a general guarantee, not directed specifically to India, by all the nuclear powers to regard nuclear aggression by anyone on anyone as an act of war against all states.

The United States and other nuclear powers have an interest in helping the Shastri government stick to its anti-nuclear policies. For it is very hard to find anyone—hard-liner or believer in detente—who does not share the view that the world will be safer if the spread of nuclear weapons can be slowed.

But so far, in public at least, nothing has happened beyond the rather vague unilateral "assurances" by President Johnson last fall that countries facing a nuclear threat can count on U.S. support. U.S. officials have refused to be more specific.

Hence the dilemma of the Indian government and the nuclear powers, suggested by such remarks by Indian high officials as those by Foreign Minister Swaran Singh:

"We are not asking for any nuclear shield from any particular country. We are posing a problem before the main nuclear powers: if they want non-proliferation, if they want

(Continued on page 2)

AAAS WARNS SOCIETY OF DANGERS OF HASTE

The following editorial appeared in the *New York Times* on January 2:

The American Association for the Advancement of Science's Committee on Science in the Promotion of Human Welfare has issued a most important document on the relations between science and society. It is simultaneously an indictment of the situation prevailing in recent years and an implicit warning that even more serious dangers may be ahead if corrective action is not promptly taken.

The indictment is grave. It is that the tremendously powerful scientific tools now at man's disposal have been used with excessive haste and before complete understanding of their full effects was available. Thus, thermonuclear tests were conducted in the atmosphere for years before the existence of the most serious health hazard in nuclear fallout, iodine-131, was even known to responsible authorities. Potent insecticides have been introduced into the environment without adequate appreciation of their lethal consequences to fish and animals, not to say humans. Synthetic detergents were introduced widely without advance realization that they would not be broken down by sewage bacteria, as is soap, but would instead produce acute problems of sanitation and possibly health.

The warning is plain. If society continues this kind of hasty and inadequately considered application of its scientific and technological capabilities, it may yet take steps the unforeseen consequences of which might cause irreparable harm to the human race. As the committee report notes: "Science has developed powers of unprecedented intensity and world scale. The entire planet can now serve as a scientific laboratory." If something goes seriously wrong with a planetary experiment, all will suffer.

The solution to this problem, the A.A.A.S. committee believes, must come from a vast reduction in the existing governmental and commercial secrecy that prevents adequate independent scientific evaluation in advance of proposed large-scale experiments and technological innovations. The committee members recognize the difficulties facing their proposal, but they insist on the need for prompt action.

The breaking down of this secrecy will not be adequate if confined to the United States. All mankind can be threatened by unexpected consequences of scientific or technological innovations made in other advanced countries as well. The need is for worldwide appreciation of the serious warning now given, and worldwide action—perhaps through the United Nations—to meet a worldwide problem.

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

INDIA'S DILEMMA AND A STATEMENT FROM FAS

(Continued from page 1)

that other countries should not develop their own weapons, it is for them to devise some method of reassuring the countries that do not possess nuclear weapons that they should not feel insecure and unsafe in this condition."

STATEMENT ON NON-PROLIFERATION

The most important issue now facing the nations of the world is the prevention of the further proliferation of nuclear weapons. The recent explosion by Mainland China of an atomic bomb has led to the reconsideration by nations like India of their previous decisions not to embark on a course of independent production of nuclear weapons.

The Federation of American Scientists applauds the decision of the Indian Government to maintain its previous resolve against independent production of nuclear weapons. India's decision is not only morally laudable; it can also be defended solely on the basis of Indian self-interest and national security. With each new nation that joins the "nuclear club," the security of all, including that nation's, is materially decreased, and the threat of nuclear war increased. Furthermore, each new addition to the list of nuclear nations erodes the prospects for discouraging further proliferation and weakens the arguments of the advocates of restraint in the non-nuclear nations concerned.

Taking these considerations into account, the FAS suggests that in order to prevent further proliferation of nuclear weapons a system of guarantees be developed by the major nuclear powers, with the approval of the UN. Such a system would be designed to protect nations which have renounced the acquisition and manufacture of nuclear weapons against the use or threat of use of such weapons by other nations against the renouncing nations. Such a guarantee should be accompanied by definite steps of agreed restraint in nuclear weaponry by the major nuclear powers, setting forth a new trend away from the arms race as an incentive to the non-nuclear powers to exercise the restraint required of them.

The FAS calls on President Johnson to press vigorously for further steps toward meaningful non-proliferation assurances and other arms control and disarmament measures at the Eighteen-Nation Conference at Geneva, and in particular for more strenuous efforts to stop further production of nuclear weapons by the nations now producing them, and to reduce present stockpiles of weapons grade fissionable materials.

SECURITY IN GOVERNMENT ASSAILED

More than 25 Representatives and Senators of both parties are co-sponsoring a "freedom of information" legislative effort. A freedom of information bill passed the Senate last year, but was never considered by the House. Under its provisions, every Federal agency would be required to "make all its records promptly available to any persons." Representative John E. Moss (D.-Calif.) and Senator Edward V. Long (D.-Mo.) introduced identical bills into both houses of Congress in February. Eight categories of "sensitive information" exempt from the bills are:

1. National Security secrets specifically protected by executive order.
2. Documents solely related to personnel records and practices.
3. Information specifically protected by other laws.
4. Privileged private commercial information obtained from the public, such as trade secrets.
5. Agency memorandums dealing solely with matters of law or policy.
6. Personnel and medical files.
7. Files of law enforcement agencies dealing with investigations.
8. Reports of financial institutions submitted to regulatory agencies.

(Washington Post, 2/14/65)

ETZIONI SPEAKS ON ACDA BUDGET

(Continued from page 1)

agreement was reached in 1955 by which Soviet troops were withdrawn from Austria, parts of which were as much under Soviet control then as East Germany is at present. Millions of people and thousands of miles of territory were liberated.

A second widespread belief which research could investigate is that any neutralized country would soon be subverted by Communism. This is surely not true. Austria, for example, was expected to be "taken over," but this year we will celebrate the tenth anniversary of the neutralization treaty and of a free Austria. It has been a decade in which *neutral Austria has served as an effective buffer zone between East and West*, preventing the kinds of clashes and tensions that are common when the two blocs face each other directly, as in Germany, Vietnam, and Korea.

Finally, a study of neutralization could dispel a third widely held belief—that power-backed neutralization is effective only if countries have viable economies and stable political institutions, and that, therefore, neutralization cannot be stabilized in most under-developed countries. *The record shows that Afghanistan, Burma, and Cambodia, all neutral countries, have maintained their independence more effectively than South Vietnam.* (For further elaboration of the prerequisites of power-backed neutralization, or "remote deterrence," see Amitai Etzioni, *Winning Without War*, Doubleday, 1964.)

This example illustrates a general point: many of ACDA's researchers are occupied with studies of the physical control of arms, verification of a "freeze" of strategic weapons, and methods of avoiding direct United States-Soviet confrontations, so that insufficient energy, staff, and funds are left for a thorough study of such political-military questions as neutralization.

Regional wars: Let me, more briefly, indicate other areas in which ACDA has yet to develop its contributions. I was in the Middle East four weeks ago and met there with high-ranking, local army officers. It seems that in the near future *another war is likely to break out in that area.* It might erupt if the Arab states divert significant amounts of water from the Jordan tributaries in an attempt to thwart the Israeli irrigation project. Or, it might occur if Egypt's missiles and guidance systems develop to the point at which Egypt could strike at Israel.

Such a war would be destructive for the region, and it might involve the United States in a world war. ACDA has yet to significantly participate in the search for ways to avoid war in this area. Again, the common belief is that nothing can be done, but this is exactly what ought to challenge a researcher to find new answers.

Similarly, ACDA's limited facilities did not allow it to participate actively enough in studies to solve the dispute between Turkey and Greece concerning Cyprus, to remove the danger of armed conflict between Pakistan and India, or to advance disengagement in Europe (for which, I learned in Geneva, the Russians might be willing to accept some far-reaching inspection systems). I am aware of some regional arms-control studies ACDA contracted, including some on my own campus, but their scope, depth, and funding is far from adequate.

Although part of ACDA's mandate was to study the problems of readjustment arising in industry and the reallocation of national resources, it was not provided with sufficient means to participate in such conversion of military facilities to peaceful uses. The closing of the naval yard in Brooklyn gave me some familiarity with this problem. First came the announcement of the closing of the yard by the Secretary of Defense; then there was a great outcry in the community over the loss of jobs and income. Now there is still much

demand to reverse the decision. *Political leaders of the community, afraid to appear weakening in their fight for the Yard, have delayed the initiation of programs to put the Yard to non-military usages.* The Pentagon's Office of Economic Adjustment has not yet been invited to take action. Meanwhile, the impression is firmly planted in the minds of the community that closing a military base—whether to reduce economic inefficiency or to reduce arms—spells loss, dislocation, tragedy. The fact that communities in which military facilities have been closed have often benefited from the closing by using the sites and the manpower for more productive industrial or public purposes remains hidden.

Long-run research: There is no question that most of the best research conducted in this field requires more than two years for its completion. Many research projects require a full year to develop adequate measuring instruments and to divide the work into its necessary components; it is quite common for collection of data to run one to two years and for analysis to take a similar stretch. It would be best if ACDA were free to determine the length of a study by its intrinsic needs and not be restricted by other considerations. Unduly restricting the time span of research does increase costs, tends to encourage studies of minor rather than major issues, and leads to a segmental rather than a broad perspective. Such restrictions make some of the most urgently needed studies impossible.

Moreover, the Pentagon's Office of Economic Adjustment is an extremely small committee. It cannot enter a community until the leaders have played out their resistance. *ACDA ought to be empowered to study communities that face conversion and to explore the possibilities for economic conversion before any military facility is shut.* It also should be encouraged to cooperate with the Labor Department and the Department of Health, Education, and Welfare in identifying alternative needs of the community, designing training facilities, etc. The closing of a military base should be accompanied by the opening of a new industry, an educational complex, a recreation area, or whatever the case might warrant; it should be a source of joy, not of sorrow.

Educational work and communication: Recently I was invited to give a lecture at the University of Utah in Salt Lake City. I found in the center of the campus a NASA display which publicized the agency's purpose and the need for its work. A movie by NASA was shown and a NASA official joined me on the platform. He mentioned that NASA is conducting similar "educational" programs in high schools and grade schools as well. NASA awards well-paying fellowships and pays universities in which students study space problems. The three armed services have similar programs. On the other hand, the public information budget of ACDA is far less than needed. ACDA research does not sufficiently come to the attention of non-ACDA researchers across the country who work in the same field. My mail, for instance, carries only once or twice a year an adequate communication on ACDA's research. It does not allow me to see what work is being done or what ought to be done. *Visits by ACDA representatives*, which could provide more personal contacts between scientists on the campus and the work done by ACDA, *are much less common than visits by representatives of the armed services.* Mixed ACDA-university conferences are rare. One of the few that have taken place produced a report of major importance (*Verification and Response*, Woods Hole, 1962).

ACDA, far from being an overbearing agency as has been claimed, does not show the necessary leadership in new ideas and research, but somebody must provide leadership towards arms control and disarmament. ACDA sometimes explores controversial topics, but somebody must *continually* explore such ideas. Although not everything that is controversial is valid, much that has been found to be valid was once

(Continued on page 4)

ETZIONI SPEAKS ON ACDA BUDGET

(Continued from page 3)

viewed as controversial. ACDA usually advises only in a low key in favor of the prevention of nuclear spread, against the MLF, for extension of the detente, but some agency must feel free to speak vigorously for arms control and peace.

The nature of our government system, it has been pointed out, is such that pluralism prevails. That is, the policy followed is worked out through give and take among different agencies under the guidance of the President and the watchful eye of Congress. If one agency suffers from insecurity while others are assertive, its considerations will not receive the attention and weight they deserve. The contrast between NASA, which has few inhibitions, and the hobbled ACDA is a relevant example. NASA's annual research and development budget is more than four-hundred times that of ACDA, and, at the same time, it receives much more encouragement and attention. Astronauts address joint sessions of Congress, are congratulated by the President when they complete a sub-orbital jump, are showered with ticker-tape on Broadway, and are celebrated in the public schools. ACDA work is virtually unknown; research which shows how the probability of war can be reduced or nuclear spread avoided is not similarly feted. Little support is given to education toward world peace through world law.

ACDA's "timidity complex," evolved from the hostile reception by some members of Congress and the pressure of much tighter scrutiny than usual, has given it a complex that leads it often to seek "safe" research and adhere to non-controversial positions, where daring research and courageous stands are called for. Let there be no misunderstanding—all agencies should fully respect Congress and respond to its demands and inquiries. *But, paralyzing fear and retreat are neither expected nor desirable.*

As Congress is partially responsible for the hobbling of ACDA, it might well be the one to initiate correction. If ACDA were given more indication of support, more funds, and permanent authorization, it might be able to attract more highly qualified researchers, conduct more of the studies that are so urgently needed, and feel freer to take stands with the vigor its mission requires, so that we may be both free and alive.

To provide for more research, to assist conversion, to increase public information, to stress the importance of ACDA's missions attributed to it by Congress and the confidence Congress has in ACDA's accomplishments, *we recommend that:*

(a) the appropriation of ACDA be increased to \$80 million for four years. This is more than ACDA initially requested, but Congress appropriated more funds than requested before. It awarded more money for bombers than the Defense Department requested; surely it could be as generous for an agency charged with discovering "opportunities for improving the hopes for peace," as President Johnson stated recently in a special message to Congress. Congress expressed its concern with the health of the nation by appropriating in 1962 \$100.4 million more than the National Institutes of Health asked for. Surely the same is called for when an agency working toward the creation of "a world which is free from the scourge of war and the dangers and burdens of armaments; in which the use of force has been subordinated to the rule of law; in which international adjustments to a changing world are achieved peacefully;"

(b) that funds be authorized on a permanent basis—at least on a four-year one—as the agency itself requested. Long-term appropriations assure that long-run research will be conducted and will make the recruitment of a high-quality staff easier. It will also serve to stress Congress' power to review its work;

SCIENTISTS DENOUNCE U.S. USE OF GAS WEAPONS

The Federation of American Scientists condemns in the strongest possible terms the use of chemical and biological warfare agents in the Southeast Asia area, a use which has now been officially confirmed. We have voiced our opposition to such actions in the past. We find it morally repugnant that the United States should find itself the party to the use of weapons of indiscriminate effect, with principal effectiveness against civilian populations. The justification of such weapons in warfare as "humane" will, in the long run, hurt the security of the United States, even if military effectiveness in a specific situation can be demonstrated.

Supporting Statement

In past statements (see statement dated July 19, 1964), the Federation of American Scientists has called attention to the fact that the defense against biological and chemical agents is comparatively simple for disciplined troops but much harder to achieve for civilian population. These weapons are, therefore, primarily weapons of indiscriminate mass attack, possessing only limited military value. The news stories coming out of Saigon confirm, in fact, that gas attacks have been mounted against civilian populations suspected of harboring Viet Cong elements. The characterization of such applications as "humane" is incomprehensible, to say the least.

In recent weeks, we have been treated to a succession of stories which have included the employment of napalm against villages, the use of crop-destroying agents, so-called defoliating chemicals, and now the use of gas against civilians. Whether a chemical, which induces extreme nausea and acts as a cathartic, inflicts lasting effects on its victims of all ages and in varying states of health, we cannot possibly know.

We have previously pointed out that biological and chemical agents are easy to mass-produce, that the manufacture is cheap and easily concealed. To proliferate their possession and use will in the long run hurt the security of the United States by increasing the danger that irresponsible governments or juntas will feel unconstrained to use them for international blackmail. Furthermore, the use of United States-produced chemical and biological weapons in Asia will be interpreted widely as "field-testing" of these weapons among foreign people and will hurt our efforts immeasurably in good will and moral respect all over the world.

(c) that ACDA be released from an earlier restriction on its public information service to allow it to maintain sufficient and effective contact with researchers at universities, educators, and interested civic groups across the country;

(d) that ACDA be released from an earlier restriction to conduct studies through research centers abroad that might have special access to information relevant to regional arms control problems;

(e) that the Senate Foreign Relations Committee encourage the agency to become the center of new ideas and the initiator of effective measures to achieve arms control and disarmament, to serve as a counter-weight to those who specialize in protecting our security by the multiplication of armaments.

OF INTEREST . . .

The percent of all American scientists engaged in work for government organizations fell from 21% in 1962 to 15% in 1964. At the same time there was an increase in the number of scientists working in educational institutions, from 28% to 35% of all those employed. (*Physics Today*, March 1965)

The Amalgamated Laundry Workers announced in January that birth control information and devices would be supplied free to 19,000 union members at the union's health center in New York. It is the first labor union in the United States to sponsor such a program. (*New York Times*, 1/14/65)

The Soviet Union is constructing a desalination plant on the east shore of the Caspian Sea at Shevchenko which will operate from nuclear energy. A conventional power installation is already supplying residents of the area with 1.5 million gallons of fresh water daily from the brackish sea. (*Washington Post*, 12/10/64)

A New York surgeon and his wife have been granted passports to visit Red China, breaking through the travel ban. Dr. and Mrs. Samuel Rosen of Katonah, N.Y., requested permission to go to China to demonstrate an ear operation for the restoration of hearing. The State Department granted the passports because the trip was for "humanitarian purposes." (*Washington Post*, 12/13/64)

The *London Observer* said that Western intelligence chiefs believe China may be capable of making a hydrogen bomb by 1970 and delivering it by long-range rocket in 1975. (*Washington Post*, 3/7/65)

The International Rice Research Institute at Los Banos in the Philippines, which was founded with the joint support of the Ford and Rockefeller Foundations in 1960, in cooperation with the Republic of the Philippines, announced results of its research on the staple food of 60% of the world's population. The institute is developing new varieties of rice that will make it possible for farmers in many areas to grow two rice crops a year, where before they could grow only one, and three crops where two were formerly grown. Its work is of special relevance in Asia, which produces and consumes more than 92% of all rice grown, but has rice yields that are consistently among the lowest in the world. (*Ford Foundation Release*, 3/7/65)

The Public Health Service is beginning a five-year program which will extend into more than 9 states, to discover the effect of pesticides and chemicals on the health and normal activities of the average person. It will be a large-scale study, including examinations of household dust, food, paint, water and air. The study also intends to include post-mortem examinations of kidney, liver, brain, and other tissues of normal people, for pesticide residues. (*Washington Post*, 3/4/65)

FRENCH "ON SCHEDULE" IN ATOMIC ENERGY

The French Cabinet was told in February that the country's program for military and civilian use of atomic energy were proceeding on schedule. A report by Gaston Palewski, Minister for Scientific Research, included the statement that French armaments factories were furnishing atomic bombs without delay to the strategic striking force that is being developed. According to the report, the big isotope separation plant at Pierrelatte in the south will be completed by 1968. This plant will furnish the enriched uranium needed for the hydrogen bomb.

Lacking enriched uranium now, French engineers are building atomic plants for the production of electricity using natural uranium moderated by graphite and cooled by gas. Two electricity plants using the natural uranium process now exist, and two are in the planning stage. (*New York Times*, 2/11/65)

WATER POLLUTION DRIVE MADE POPULAR

The following article from the *New York Times* of March 6, 1965, describes efforts to reduce stream pollution in the southeast United States.

An aggressive duck named "Georgie Quacker" is becoming as widely publicized a two-dimensional figure in Georgia as Smokey, the fire prevention bear.

Georgie, often depicted standing in a stream looking quizzically at a test tube of water, is a symbolic spearhead of a far-reaching state and regional effort to end the water pollution that has assumed the proportions of a national blight.

The Southeast presents dismaying evidence that population and industry, and their inevitable liquid wastes, have grown so in a couple of decades that a natural plentitude of water no longer suffices to flush the waste away.

Problem Widespread

Georgia, with 50 inches of rain annually, is crisscrossed with streams containing stretches of pollution. Adjacent states have similar problems, as do most others in the country.

The immediate causes are lack of adequate community sewage treatment facilities, and adherence by many industrial concerns to habits of casually dumping large quantities of waste into streams. These streams once could dilute the waste to innocuousness but now, overloaded, simply impose the wastes on people down-stream.

"Used to be good fishing here," an Atlantan said today, pointing to a stretch of the Chattahoochee River that serves both as the city's water source and waste-disposal channel.

"But," he added, "it got so the catfish tasted so bad of oil you couldn't eat 'em."

Now it is difficult for any living thing other than bacteria to survive in the Chattahoochee's local repulsive brown currents.

Paper Is Critical

The Atlanta Constitution editorialized the other day on the "bad" Chattahoochee situation: "The old days of pretending this doesn't matter are gone. Wastes from Atlanta block further utilization of the river downstream. We have drifted so long that corrective action is going to be phenomenally expensive. We are going to need a lot more cooperation between politicians than we have been accustomed to getting."

Georgia tried in 1957 to clean up water courses by setting up a council. But it turned out that four of the seven members represented industries that some have accused of having something like a vested interest in stream pollution.

Occasional extreme proposals have been made from industrial quarters for "classification" of water courses, with some being designated as waste-disposal channels and stripped forever of their role as esthetic and recreational assets.

The opposite side of the coin is the many industrial concerns that are including proper waste treatment equipment in the design of new plants.

In between are some established concerns, such as several steel companies that regularly discharge pollutants into the Mahoning and other Ohio Basin rivers, that profess good intentions but insist that installation of waste treatment in their obsolescent plants would push production costs too high.

Emphasis On Public

Even the power companies that discharge fairly clean water are often in the pollution business, because the water comes out hot. A 75-degree increase in stream temperature, qualified pollution engineers say, can upset the animal, plant and bacterial life cycles that normally work to digest, neutralize and purify waste.

Some public officials feel that public pressure on major waste producing industries, such as steel, chemicals, paper and textiles, eventually will force them to "clean up."

(Continued on page 6)

APRIL COUNCIL MEETING OF FAS

The April Executive Council Meeting of the Federation of American Scientists will be held in Washington, D. C. on April 25-26. Details of the meetings will appear in the next *Newsletter*.

WATER POLLUTION DRIVE MADE POPULAR

(Continued from page 5)

The National Association of Manufacturers says American industry is spending \$100 million a year to reduce pollution, and the Public Health Service corroborates this figure. But there are many concerns that, one Federal official said, have no public image—except as big local employers who equate pollution with payrolls and seek immunity from local regulation.

Last year Georgia set up a nine-member State Water Quality Control Board, coordinated with the State Health Department, with authority to promulgate sweeping regulations and standards on pollution.

Within four months it issued an order requiring all municipal and industrial sewage sources to give waste not only primary treatment (settling of solids) but also secondary treatment, eliminating up to 90 per cent of the obnoxious components.

In its first six months, the board investigated 24 stream pollution situations, leading to eight clean-up orders to municipalities and industrial establishments. During the period, 14 sewage treatment projects totaling \$11,666,000 were started throughout the state.

To galvanize public interest, the Association of County Commissioners invented "Georgie Quacker" as a propaganda device. The association has sold thousands of \$5 packets of gummed stamps with his image. It has also organized corps of "river watchers" on the state's principal streams "not to snoop, but to chart progress."

Florida is also in the process of transferring water quality control from its State Board of Health, where it has been handled essentially as a disease problem, to the Board of Conservation, which will stress other implications.

Half of Florida's citizens do not have municipal sewage connections, instead using individual septic tanks.

As in Georgia, extensive shellfish areas near river mouths have been put out of operation by pollution. Officials have even expressed concern about sport fish, an important element in Florida's tourist industry.

Meanwhile the United States Public Health Service has started in the Southeast one of a score of projected studies of river basins across the country aimed at producing water pollution control plans for the next 50 years.

The Southeastern survey project encompasses 146,000 square miles of Georgia, Florida, Alabama and Mississippi. The area's population is now about 15 million. It is expected to grow to 21 million in the next 15 years. The region has eight watershed basins involving 20 rivers. The study will take six years and cost \$4.5 million.

An important consideration in the study will be the dovetailing of future activities of the numerous Federal agencies concerned with water development whose objectives sometimes conflict. Thus the dams built by the Corps of Engineers and under soil conservation programs of the Department of Agriculture may reduce stream flow desirable from a pollution standpoint.

CALIFORNIA-AEC ATOMIC PLANT PROPOSED

The California Farm Reporter, February 1965, printed the following news on the State-AEC agreement:

The Atomic Energy Commission and the State of California, Jan. 2, announced agreement for joint participation in construction of a new breeder-type atomic power plant to be located in the Tehachapi Mountains or along the coast between Santa Barbara and Pismo Beach. The latter site would permit operations of a desalinization facility in conjunction with the atomic plant.

Of the estimated \$100 million cost, California—which would own and operate the plant—would contribute \$80 million toward the capital investment, AEC, \$20 million. AEC would also provide the initial atomic fuel and contribute \$80 million for research and development, part of which would be repaid by California after the plant is operating. The plan must receive congressional approval.

Most of the plant's 525,000 kw capacity would be utilized by the State Water Project to lift water over the Tehachapis. The AEC is interested in the project because of its unique reactor design.

"Seeds" of fissionable material, in this case uranium, would be surrounded by a blanket of fertile but non-fissionable material, thorium. As the reactor runs, some of the thorium is converted into fissionable uranium.

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