

# F. A. S. NEWSLETTER

Volume 17, No. 2

February, 1964

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

## SCIENCE BUDGET REQUESTS

President Johnson's budget for the next fiscal year presented to the Congress on January 21, calls for \$488 million for the National Science Foundation—an increase of 38 percent over the \$353 million appropriated, but \$100 million less than was requested from Congress, for FY 1964. An appropriation of the requested \$448 million would allow a 32 percent increase in science education programs, an 18 percent increase in support of basic research, and a big 88 percent increase in programs of institutional development and improvement. HEW's request is increased by 25 percent over last year to \$7.6 billion, making HEW the department with the third largest budget, behind Defense and State. The proposed Office of Education budget of \$2.15 billion is triple its 1963 budget of \$662 million. The NIH request is for \$1.05 billion, an increase of \$84 million over 1964. NASA could get \$5.3 billion. Of the \$15.3 billion asked for research and development, almost half is in the space area. Far less than a third is for research.

## INTERNATIONAL SPACE VENTURES

Echo 2, a balloon satellite 135 feet in diameter, was successfully launched from a California missile site on January 25. The big satellite, made of aluminized plastic film, is being used for collaborative communications experiments with the Soviet Union. The joint space experiment is the first to be carried out under a cooperation agreement negotiated last summer between Hugh L. Dryden, deputy administrator of NASA, and Anatoly A. Blagonravov, representing the Soviet Academy of Sciences. The studies with Echo 2 involve optical tracking and bouncing radio signals off the balloon between the Femenski Observatory of the Gorky State University and the Jodrell Bank Observatory in Britain, whence data are relayed to the U. S.

NASA had also hoped to do cooperative radar experiments with Echo but the Russians have not yet indicated agreement.

The fragile state of such U. S.-Soviet cooperative ventures was underlined by difficulties preceding the launching. A cable from NASA to the Soviet Academy of Sciences, outlining the launching schedule and inquiring into Soviet plans for tracking the satellite, received no reply for some weeks. It was not clear until a few days before the launching that Soviet cooperation would be forthcoming.

## EUROPE AND COMSAT

Meanwhile, American, Canadian, and European representatives have begun meetings in Rome to draft the guidelines for foreign participation in the global communications satellite system being pioneered by the U. S.

The U. S. has declared, as its policy, that the system shall be developed "in cooperation with other countries"; the chief aim of the Rome meeting is to establish the degree of European interest, and to explore possible financial and management relationships. If a sufficient number of European countries are willing to invest in the system (as distinct from merely leasing channels) the U. S. may propose, as an interim setup, an international directorate of investing countries. The directorate would set long-term policy, with day-to-day management largely left to the U. S. corporation.

For the more distant future, an international communications satellite agency, with each country having a vote proportional to its investment, is being proposed by the State Department. (N. Y. Times 2/9)

## FAS POSTERS AND BROCHURES

Eye-catching posters advertising the FAS, in sizes suitable for display either on local bulletin boards or at meetings you may be attending, are available to members on request from the FAS Office, 223 Mills Building, 17th St. and Pennsylvania Ave., N.W., Washington, D. C. 20006. Please specify the number you need and the size (approximately 7 x 10 inches and 12 x 15 inches). Brochures describing FAS aims and activities, useful in conjunction with poster display, are also available in any quantity.

## FAS STATEMENT ON

### PRESIDENT'S DISARMAMENT PROPOSALS

(The following statement was approved at the January FAS Council meeting, and issued on February 6.)

The Federation of American Scientists, being greatly concerned with the spiraling arms race and the danger to the people of the United States and to mankind which is inherent in the constant increase in the number of nuclear weapons and of means of delivering them, strongly supports the new initiative by President Johnson directed toward the stopping of the arms race.

In particular, the Federation welcomes the proposal that, as a first step, "the United States, the Soviet Union and their respective allies should agree to explore a verified freeze of the number and characteristics of strategic nuclear offensive and defensive weapons." In implementing this proposal one should keep the following facts in mind:

Both the United States and the Soviet Union have now a sufficient number of strategic delivery vehicles to destroy each other not only through a surprise attack but even in retaliation for such an attack.

The main reason why each side continues to build more and more strategic weapons is that the other side is doing the same.

The situation is unstable as there is the constant danger that a technical breakthrough or a new method of deployment, as in Cuba in 1962, might be considered by one of the sides as threatening to shift the strategic balance and thus requiring immediate action regardless of consequences.

A verified freeze of the number of strategic weapons would stabilize the situation on the present level. Though at present the United States has a great lead in numbers, the Soviet Union does not find it necessary to engage in a full-scale effort to catch up, as it seems satisfied with the deterrent value of its existing stockpile of very large weapons.

A freeze would permit the Soviet Union to devote a larger share of its resources to overcoming the economic crisis which endangers its development plans. It would allow the United States to allocate more resources to President Johnson's attack on poverty and improve the situation of the suffering one-fifth of our population.

A freeze of both the numbers and characteristics of strategic weapons would diminish the chance of a dangerous breakthrough in the development of weapons with new characteristics upsetting the calculations of military planners. It is important to note that such a freeze would apply to both offensive and defensive weapons, as a revolutionary development in either category is extremely dangerous.

Finally, though a freeze must be properly verified and significant clandestine evasion needs to be prevented, it is much easier to verify the production of large delivery vehicles, of great missiles and big bombers, than the production of any other weapons. An adequate inspection system might be devised which would encroach to only a limited extent on military secrets of both sides. As a first step, for instance, inspection of a few factories in large cities might suffice; later, a check on transport would provide a sufficient assurance that new parts for some hidden assembly line are not being produced. In no case would it be necessary for inspectors to roam over the whole countryside.

Consequently, the Federation believes that the proposed freeze constitutes a manageable first step toward a world in which the people of the United States and of other nations might live in peace and security. It applauds the initiative taken and expresses the hope that other countries would be willing to accept this proposal in the near future.

## LILIENTHAL VIEWS THE ATOM

*Change, Hope, and the Bomb*, by David E. Lilienthal.  
Princeton University Press, 1963. 168 pp.

Reviewed by ELLIOT CHARNEY

This slim book, by a man for whom most of us have deep respect, says a great many things, and we should be inclined to sound a call for a great huzza if any of them were original. Unfortunately, not only have they been said before, but generally said better and with less of an aura of anti-intellectualism. It is all the more serious because this view of "The Atom," as he prefers to designate it, is in fact set forth with the full authority of David Lilienthal's perspective of years of public service in most intimate contact with the subject. It is this which makes this volume difficult to ignore.

### "THE SOLUTION"

The main thesis is that human affairs (read peace) can only be dealt with by tackling the "manageable job," and this in contradistinction to seeking "The Solution" as we have done in the past.

The latter, he maintains, is a consequence of our obsession "with the revolutionary destructive power of the Atom itself." The fact is that in 1946, "we" included not only most scientists, much of the public and Congress, but also Lilienthal himself, as he freely admits.

Most of the blame for this obsession, however, goes to the scientists who are thus set up as targets for an almost vicious attack (tempered by the attitude that "some of my best friends are . . .") in which they are accused of everything from inhibiting peace by seeking "The Solution" to greedily (albeit with honorable motives) accepting tax dollars for large and unnecessary projects. The scientists have done all of this by taking advantage of their expertise. Furthermore, not only the physical scientists have done this, but now the social scientists, learning from their more affluent colleagues, have entered the arena of government sponsored projects, viz. the "Rand Corporation, the Hudson Institute, the Institute for Defense Analysis, and so on." Nor does Lilienthal exempt the agency of which he was the builder if not the architect, the Atomic Energy Commission, or the Congressional Joint Committee on Atomic Energy from attack, as examples and proponents of "The Solution." Almost indiscriminately, are Herman Kahn, Brien McMahon, Hyman Rickover, Khrushchev, and "scientists" (unnamed except for Teller and Blackett; only Eugene Wigner gets a good grade) accused of making the error of advocating the "Grand Solution" and of being preoccupied with "The Atom."

### HOPEFUL ALTERNATIVES

The argument is that we have remained "emotionally committed" to seeking a single solution and in particular now to disarmament, and while it is somewhat ambiguous as to whether Lilienthal believes disarmament is wise, it is clear that he thinks it is not feasible and is in fact dangerous to pursue at the moment. As a "layman," Lilienthal offers instead in the final chapter, "Hope," which amounts to a pragmatic approach: "It would be well at the outset not to be too ambitious and not to encourage too grandiose schemes, in order first to develop experience in working together, in directions that in time may bring the interests of the Soviet Union and the West together." And how we are to do this.

Encourage an affluent Soviet Union (vis-a-vis the Chinese so that the latter may also one day aspire to the affluence of their European neighbors). Extend International Commerce (Jean Monnet's advocacy of the Schuman Plan and the resulting European Common Market are given as examples of how bitter enemies can be made to become great friends). Promote "international joint ventures." And listed without amplification are: "international health and food programs; international science; education; the economic development of the underdeveloped nations; international developments of unity among religious groups . . ." Is there anyone in the house who is for sin and against motherhood?

### ATOMIC POWER

If we get somewhat away from the main theme, then we find Mr. Lilienthal not only on more solid ground but also providing us simultaneously with evidence of his honesty

and with a peculiar example in which he now finds himself taking a position in direct opposition to one he took two decades ago. The problem is the peacetime uses of atomic energy and in particular atomic power. Recalling the optimism in 1946 that atomic power was already a reality and that its peaceful applications raised the curtain on vistas of a new world, Lilienthal declares: "I fully shared these views at that time . . ." And now: "Responsible men spoke of atomic power so cheap it wouldn't pay to meter it . . . The problems of securing safe and competitively economic power from the Atom have greatly exceeded the technical experts' and administrators' expectations . . . Other sources of power are ample and diminishing in cost . . . After all these years, no way safely to dispose of these waste poisons (from atomic power plants) has been demonstrated on full scale, or to handle them at processing plants, or to transport them with complete safety from power plants or processing areas to a burial ground . . . That myth of a revolution continues to be fed by the American taxpayer. Private firms repeat this fiction at this late day, as part of institutional promotion of the sale of their atomic reactors." Now it is important to note that a not inconsiderable part of this book is devoted to taking scientists to task for taking advantage of their expertise, yet layman Lilienthal is repeating now what at least some scientists were saying almost two decades ago. (For examples see the articles by Cuthbert Daniel and Arthur Squires in the *Christian Century* in 1949 and the proposals made at about that time by the Association of Scientists for Atomic Education.)

If space permitted, it would be possible to provide additional examples from the book of arguments with which it would be difficult to disagree, and of the fact that Lilienthal was and remains a sincere proponent of generally rational attitudes towards "the Atom." But in the context of the overall anti-intellectual attack on scientists, the book cannot be considered a service to the sensible discussion of the major issues of civilization and peace.

## CIVIL DEFENSE

HR 8200, providing \$190.6 million for launching a fallout shelter program intended to provide 240 million spaces by 1968-70 with final cost of about \$6 billion, now rests in a special Senate Armed Services subcommittee chaired by Senator Jackson.

The House, after voting to authorize the program, then voted down the appropriation bill to provide money for it. If the Senate passes both the authorization and the appropriation, the resulting figure will be a compromise between the Senate sum and the "zero sum" of the House.

The big question in many observers' minds relates to the rationale of a shelter program protecting only against fallout when Secretary McNamara has clearly indicated his belief that any Russian attack would be primarily upon cities (House Armed Services testimony released March 29, 1963). The Defense Department position is that, if an effective anti-ballistic missile (ABM) city defense system is devised, the enemy could still drop missiles to the windward side of the cities and depopulate them with lethal fallout, unless shelters had been provided.

William F. Schreiber, of M.I.T., pointed out in testimony before the Jackson subcommittee that, if an adequate ABM should ever be devised, the lead-time on its development would be considerably greater than that needed for setting up a fallout shelter program. He suggested that, if the effectiveness of the shelter program hinges upon that of the ABM, it would make sense to postpone the shelter program. Schreiber also suggested that the Nike X, being developed as a "sprint" missile to allow interception effort after atmospheric retardation has helped separate the decoys from the real McCoy, would simply cause the enemy to build into his missiles a device to trigger them upon contact with neutron flux from U. S. ABM's. Resultant thermal yield would incinerate city, shelters, and people.

Mr. McNamara's testimony of January 27, 1964, on the defense budget, has within it an interesting hint that blast shelters might really be the thing needed in the cities, so ABM's could operate at a lower level and thereby increase their chances of interception. This is a development that has been long predicted by opponents of the civil defense program.

### RICKOVER PIONEERS VERSATILE REACTOR

A reactor that promises to generate economical electricity and produce more fuel than it consumes is being pioneered by Vice Admiral Hyman G. Rickover. So promising is the Rickover concept that the Atomic Energy Commission is discussing with the California Department of Water Resources the possibility of building one of the atomic power plants for pumping water from northern to southern California.

The proposal is to construct a reactor with an electrical capacity of 500,000 kilowatts—larger than any atomic power plant yet built in the United States. California would contribute to the construction an amount roughly equal to the estimated cost of a conventional power plant of the same capacity.

The enthusiasm over the Rickover reactor was evidenced in a recent letter from Dr. Glenn T. Seaborg, chairman of the AEC, to Senator John O. Pastore of Rhode Island, chairman of the Joint Congressional Committee on Atomic Energy. If the Rickover concept proves successful, Dr. Seaborg said, it will "represent a major advance in reactor technology and an important milestone in our national objective of conserving nuclear fuel resources."

#### SEED AND BLANKET

To a large extent, the proposed reactor is an outgrowth of Admiral Rickover's Shippingport, Pa. atomic power station, the nation's first large-scale nuclear power plant and the technical forerunner of all the water-cooled reactors now being built in this country. Like the Shippingport plant, the new reactor would be built around the so-called seed and blanket design developed by the Rickover team. This design calls for a "seed" or highly enriched uranium surrounded by a "blanket" of natural uranium. As the enriched uranium fissions, it converts some of the natural uranium into fissionable material which in turn fissions and produces energy. In effect, the normally nonfissionable natural uranium is "burned" in the reactor.

Recently the attention of the Rickover team has been directed to the idea of using thorium in the blanket. Thorium, a nuclear fuel thus far little used in reactors, is like natural uranium in that, under the irradiation of neutrons produced in the fission reaction, it is converted into a fissionable material. Natural uranium is converted into plutonium; thorium into uranium 233. Research into the thorium blanket concept has now demonstrated that such a reactor should be able to "breed," i.e., to produce more fissionable fuel than it consumes. As the research progressed, it became clear that large seed-and-blanket reactors using thorium fuel have "unusual potential for generating economic nuclear power and for breeding." (N. Y. Times, 2/2).

### CONGRESS STUDIES R&D

The following is a status report on congressional inquiries into federal or federally supported research and development activities.

I. Elliott Committee (The House Select Committee on Government Research). Testimony was taken from 72 witnesses during November, December and January. After the hearings, the committee, which has a \$553,000 budget and a year in which to work, started studies on: (1) Administration of research projects, (2) Major research facilities, (3) Fiscal and contractual policies, (4) Impact of government research on higher education, industry, and business, and geographical areas and states, (5) Providing student assistance, (6) Interagency coordination of research projects, (7) Statistical review of government research (cost and purpose of federally financed activity), (8) Documentation, dissemination, and exploitation of research results, (9) Manpower for research, and (10) National goals and policies.

The committee's eight-man staff recently added a technical director, William B. Farrington, Vice-President of the Empire Trust Company, New York and two prestigious advisory committees, a General Advisory Committee and a Science-Engineering Advisory Committee. Questionnaires have been sent to all federal agencies involved in research and development. Because of the great size of the task it has set itself and shortness of time, the committee will do well to produce two or three comprehensive studies. Despite early fears, the committee seems to have a sympathetic attitude toward the government's involvement in research and development.

II. Daddario Committee (Subcommittee on Science, Research and Development of the House Committee on Science and Astronautics). A report resulting from hearings at which eight scientists and science administrators were heard has been issued. The report, the first in a planned series, raises 20 questions it does not attempt to answer. The report says "perhaps the most pressing immediate concern of the government is the management of its own research and development effort." Further, the committee has taken a new step to solve problems caused by Congress' inability to obtain outside advice on programs and proposals presented by the executive branch and has established a relationship with the National Academy of Sciences under which NAS will advise Congress on scientific policy issues.

III. The Fountain Committee (House subcommittee on Inter-governmental Relations). In the science area, this committee has concerned itself principally with NIH, and is currently looking into NIH's fellowship and training grant programs.

### CULTURAL EXCHANGE PACT SIGNED

The U. S. and the Soviet Union signed a new cultural exchange agreement on February 22. The two-year accord, the fourth since 1958, provides for slightly increased exchanges, especially in industry, agriculture, medicine, and public health. No expansion in student exchanges, currently about 40 a year, is envisaged.

In the negotiations preceding the agreement, which were delayed for two months following the arrest and detention of Yale University Professor Frederick Barghoorn, the U. S. had pushed for a much broader increase of exchanges, while the Russians had asked that the formal agreement approve in advance direct contacts between non-governmental organizations of the two countries. The U. S. resisted such blanket approval on the ground that American private groups were genuinely independent agents outside government control and had no counterparts under the centrally directed Soviet system.

As a compromise, the agreement provided that exchanges outside diplomatic channels could be agreed upon by "appropriate organizations requested by the parties" to carry out such activities.

Scientific exchanges are already handled in large part under separate agreements, including one between the National Academy of Sciences and the American Council of Learned Societies on the one hand and the Soviet Academy of Sciences on the other. (N. Y. Times 2/21; 2/23).

#### ENROLL A NEW FAS MEMBER NOW!

Federation of American Scientists, 223 Mills Bldg., Washington 6, D. C.

I wish to support FAS by becoming a:

Member       Subscriber       Contributor

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

Membership Dues: Regular -\$7.50 (income below \$4500 -\$4)  
Supporting -\$10; Patron -\$25; Student -\$2

Subscription to FAS Newsletter -\$2  
(10 issues per year; free to members)

Contribution . . . . . \$

Make check payable to: FAS

Please send information on Group Life Insurance  
 Please send information on special rates to FAS members for Bulletin of Atomic Scientists

## NUCLEAR POWER PLANTS SAFE, AEC DECLARES

The Atomic Energy Commission has asserted that nuclear power plants "may be safely operated under all normal conditions." "Even in the unlikely event of an accident," the commission said, "public health and safety would not be endangered." The AEC expressed this belief in a long document undertaking to answer the question, "How safe is a nuclear reactor?"

So far the Commission has not been formally asked to authorize construction and operation of a large civilian atomic power plant in the heart of any United States city. Sooner or later, however, if atomic power grows the way the AEC thinks it will, this decision will have to be made. The Commission's report, plus past remarks by Commission members, may provide a clue to what the decision will be.

A ruling was postponed recently when Consolidated Edison Co. of New York abandoned tentative plans to build a large nuclear plant in the middle of New York City. (See Newsletter, 1/64). Former AEC Chairman David E. Lilienthal and many others had denounced the plan as unsafe. The present AEC chairman, Glenn T. Seaborg, said last fall he would "not fear having my family residence within the vicinity of a modern nuclear power station built and operated under our regulations and controls."

### AEC EXPECTATIONS

There are 14 civilian nuclear power reactors in the United States. Their capacity is more than a million kilowatts—enough to meet household power requirements of more than a million families. The AEC expects this generating capacity to grow until, in the year 2000, half of all electrical power produced in the United States will come from the splitting atom.

According to the AEC, a bomb-like explosion in a nuclear power reactor is "impossible." But that does not mean a carelessly designed reactor could not explode just as a poorly constructed steam boiler might. If a reactor's fuel core got too hot and melted down, the cooling water would be flashed into steam and dangerously radioactive materials might be spread about. AEC regulations are designed to prevent any such accident. Automatic control rods shut down a reactor when signals indicate the power level is getting too high.

Including the 14 civilian power reactors, nearly 300 reactors of various kinds are in operation or under construction in the United States. It has been more than 21 years since the first atomic reactor was started up. In that period there have been 18 accidents involving nuclear chain reactions in AEC laboratories or experiment stations. Six men died. None of the accidents, however, had anything to do with a civilian power plant. "The safety record of U. S. reactors to date," the Commission said, "is evidence" that atomic power plants pose no special dangers. (Wash Post, 1/26).

## FAS NEWSLETTER

Federation of American Scientists  
223 Mills Bldg.  
17th Street & Penna. Ave., N.W.  
Washington 6, D. C.

Volume 17, No. 2 February, 1964

## FOCUS ON WORLD POPULATION

More American organizations as well as the United States Government are beginning to face up to the problems posed by a population growth that is outstripping economic gains in almost every country in the world, according to a special "Focus on World Population" in the current issue of INTERCOM, published by the Foreign Policy Association.

A six-page chronology shows the rather gingerly steps by which the U. S. Government arrived at the point in December 1962, when a State Department official stated that the U. S. would "help other countries, upon request, to find potential sources of information and assistance on ways and means of dealing with population problems." Even now, only \$5 million out of the \$15 billion of Federal funds spent yearly for research, goes to research on reproduction and birth or population control. The activities of the National Institutes of Health, the National Science Foundation, the Agency for International Development, and the Bureau of the Census in the population field, are described in the report.

The United Nations too has been very gradual in its approach to the population problem. Although it recognized the problem by setting up a Population Commission as early as 1946, it was not until 1962 that the General Assembly passed a resolution on the subject of population. The resolution did no more than call for the various UN bodies to intensify their study of population problems as related to economic and social development. INTERCOM points out that the UN has directed its efforts toward "gathering, processing, analyzing and interpreting figures on world population and in training demographers and census takers for service in developing areas of the world."

Sweden is the only government that has made birth control assistance a major part of its expanding foreign aid program. India, Korea and Pakistan have adopted official policies and are conducting population programs, while experimental or pilot projects are being conducted in Taiwan, Tunisia, Turkey and the United Arab Republic.

The review also describes the programs, publications and services of 33 private American organizations dealing with the problem, including professional societies and other voluntary organizations in related and seemingly unrelated fields. (The INTERCOM issue is available for \$1.00 from the FPA, 345 E. 46th St., New York, N. Y., 10017.)

## FAS NEWSLETTER

Published monthly except during July and August by the Federation of American Scientists, 223 Mills Building, 17th Street & Penna. Ave. N.W., Washington 6, D. C. Subscription price: \$2.00 per year.

Chairman..... Robert R. Wilson

The FAS Newsletter is prepared in Washington by FAS members. The staff for this issue were: Editors—L. & M. Gellert; Writers: F. K. Millar, P. Small.

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

Second Class Postage

Paid at

Washington, D. C.

Return Postage  
Guaranteed