F. A. S. *NEWSLETTER*

Volume 21, No. 4

April, 1968

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

RECOMMENDED IMPROVEMENTS IN U.S. POWER DEVELOPMENT POLICIES: STATEMENT FROM THE LOS ANGELES FAS CHAPTER

Because of the rapid increase in per-capita power consumption by U.S. citizens, new power sources, particularly nuclear power plants, are being developed throughout the country. In order to achieve maximum benefit from them, it is necessary to make sure they are developed as efficiently as possible. Particularly in today's technological world it is of crucial importance that power development proceed in a carefully considered way because the impact of modern science and technology so interrelates all aspects of our society as to magnify enormously both the possible gains and the possible errors of any new development. In the extraction of power from our environment, whether it be in the stored chemical energy of coal, the potential energy of falling water, or the energy binding atoms together, we transform the nature of our environment.

Nuclear power promises to alleviate some of our increasing problems of atmospheric pollution because it does not discharge sulfur oxides and hydrocarbons into the air as waste products. But we must be careful that low-level radiation hazards or long-range radioactive waste disposal problems do not overbalance the short-run gains. Engineering improvements and precautions have greatly reduced the chances of nuclear power plant accidents, but this must be balanced against the enormously greater damage an accident could possibly cause if it did occur. Because of increased population densities, it also becomes necessary to consider the number, size and location of power plants and their effect on the quality of our environment as a whole. In short, it is today becoming increasingly impossible to prevent the effects of development in one technological area from raising problems in other areas and affecting all aspects of our society.

We must remember that in the end our purpose in developing any given facility, say power, is to help us to live constructively in a pleasant, stimulating environment. If, in the process of achieving one particular amenity, such as trasportation or illumination, we have impaired our health, scenery, safety or any other desired facility, then we have achieved little and perhaps suffered a net loss. It is with the aim of raising the quality of life in our whole environment that the following suggestions are made with respect to developing one of the crucial components of modern society—power resources.

I. DIFFERENT KINDS OF POWER RESOURCES AND THEIR PROJECTED DEVELOPMENT

Conventional power resources such as gas, oil and coal have been regularly surveyed in the United States. It is acknowledged that this inventory is important. This clear picture has been complicated in the last decade or so, however, by the scientific breakthrough of nuclear energy. It is a fact, however, that research in and development of nuclear energy was not aimed initially at solving the problem of power resources. It was, instead, developed and used as a wartime weapon.

Many Americans have felt, perhaps almost unconsciously, that the tragic aspects of the use of nuclear energy as a weapon would be compensated to some extent by its constructive use as a power source for peoples of the world. Un-

Continued on page 2, col. 1

NEWS ITEMS

Should scientists and scholars be paid for offering expert testimony to Congressional committees? This question has arisen in connection with the fees received by several economists who testified recently before a Senate Small Business subcommittee investigating competition in the prescription drug industry. Their testimony was clearly labeled as sponsored by the Pharmaceutical Manufacturers Association (PMA). No law was broken and no deception was intended. But it appears that the five professors and one economist-consultant received fees totaling $40,000 in connection with their testimony. The fees were high, ranging up to $1,200 a day. The testimony of the six economists, offered last December 19th, bolstered the PMA argument that industry profits are high because research risks are high, and that to lower drug industry profits by price reduction would have a serious adverse effect on the industry.

A few other cases of specialists, generally economists or professors in business schools, receiving high fees for testifying or supplying statements supporting industry positions have come to light. One example is the case of a business school professor who received $400 a day for "eight days or parts of days" from tobacco companies or their law firms and who submitted a statement backing the industry's position against cigarette health warnings.

Other "expert witnesses," retained by the Senate Small Business subcommittee maintained that drug industry profits were excessive. The Subcommittee paid its witnesses $16 a day plus transportation, the standard rate paid by Congressional committees.

The PMA's economists concede their fees were higher than usual. One of them noted that appearing before a committee whose chairman is hostile to your position "commands a premium," and that the committees have been known to subject witnesses to "mental and emotional strain." He also noted that there was a risk to one's professional reputation. "You should see the stream of [uncomplimentary] letters I've got from my testimony," he added.

A spokesman for the Pharmaceutical Manufacturers Association observed that, "I wish we could get witnesses for $16 a day" like Congressional committees. "Believe me, we don't like spending this kind of money to defend ourselves." (*National Observer;* 18 March 1968)

* * * * * *

Evidently by way of a partial response to the Bethe-Garwin *Scientific American* article, the Pentagon is discussing in guarded terms some possible improvements in the planned Sentinel antiballistic missile system. The suggested improvements include possible modifications in the defensive missiles themselves, in the ground radar that controls them, and longer-range satellite or ground-based early warning systems.

Bethe and Garwin argued in the March *Scientific American* that China could employ a combination of offensive missile tactics and cheap penetration devices to nullify the projected $5 billion American "thin" ABM defense. They noted that "It does not seem credible to us that, even if the Chinese succumb to the 'insane and suicidal' impulse to launch a nuclear attack on the U.S. within the next decade, they would also be foolish enough to have built complex and expensive missiles and nuclear warheads peculiarly vulnerable to the light ABM system now presumably under construc-

Continued on page 3, col. 2

Recommended Improvements from page 1

doubtedly a great deal of the enthusiasm for "Atoms for Peace" sprang from this feeling. The pertinence of this point for the present discussion is simply that alternatives to nuclear energy for modern power sources have never been considered. There has simply been no unbiased appraisal of the overall most efficient way to satisfy our power needs. It may be that nuclear power is by far the most important long- and short-run future power source. But until the problem has been analyzed from an overall, unprejudiced standpoint, no one can be sure that other sources of power are not being overlooked. Nuclear power might ultimately be only one of a number of important future sources of power. The first task facing the nation, then, is to carefully calculate what the optimum division of development effort should be between various possible power sources. This brings us to our first recommendation:

A. We propose that the Federal Power Commission (FPC) study all potential power sources throughout the nation. These should include:
   1) Geothermal Energy (underground heat and steam)
   2) Energy in Winds and Tides
   3) Solar Energy
   4) Water Power (including transmission from areas like Canada)
   5) Chemical Fuels (gas, coal, oil)
   6) Nuclear Energy

B. We propose that the FPC should recommend a schedule of development by regions, taking into account the following factors:
   1) Cost of power production (including research and development costs, government subsidies, insurance, costs of construction, maintenance and depletion of resources)
   2) Environmental contamination (air and water pollution and waste disposal problems)
   3 Siting of power production (integration with urban communities, safety, siting between cities, power transmission problems, automation of facilities and possible secondary benefits such as water desalinization)
   4) Size of power production facilities, extent of power grid inter-ties and distribution of peak loads

To implement this study, we propose the FPC be authorized to contract out some of these research projects to university and private study groups. We further propose that the FPC be authorized to undertake and contract out experimental developments of certain kinds of power at certain places.

C. We propose that when an overall evaluation of the power situation is made, it be published and debated as widely as possible by all interested parties. After debate and conclusions, we urge plans be specifically recommended by the Executive branch and funds appropriated through Congress. We would envisage implementation of the plans through incentive subsidies, loans and government pilot developments. WE WOULD RECOMMEND THAT NO PARTICULAR REGION, COMMUNITY OR PRIVATE POWER UTILITY BE FORCED TO UNDERTAKE ANY SPECIFIC PROJECT WHICH WAS AGAINST ITS WISHES.

II. THE AEC AND NUCLEAR POWER

The AEC was originally charged with the responsibility of promoting and developing nuclear power. It has done an excellent job. Many scientists and legislators have been concerned, however, because there are two possible conflicts of interest with the general public. First, there is the mission-oriented promotion of nuclear power, utilizing government-AEC resources, to the exclusion of other possible power resources. Secondly, there is a potential conflict of interest between promotion and development of nuclear power facilities and the necessity for attesting that there is absolute safety for the surrounding populations.

The AEC has a large, extremely capable staff which is competent in all phases of nuclear energy. We do not propose to do anything but strengthen and utilize this capability to the fullest. But in those two areas where there should be a dialogue of opinions we propose that other agencies develop competence and furnish a check and balance for the AEC.

We recommend that the AEC continue to submit schedules of nuclear power development just the way the FPC will submit a schedule for all kinds of power source development (Proposal B). The AEC, however, would simply restrict itself to nuclear power. We propose that the AEC be urged to particularly study and add a special section dealing with subsection 3 of B, viz., siting of nuclear power plants.

THE SINGLE MOST IMPORTANT WAY IN WHICH THE FUNCTIONS OF THE AEC ITSELF COULD BE EXPANDED AND IMPROVED IS FOR THE AEC TO STUDY AND PUBLICIZE ALL ASPECTS OF NUCLEAR SITING.

If all the factors which dictate the selection of certain sites for nuclear power plants can be honestly published, discussed and debated out beforehand, the expensive, acrimonious and damaging site controversies of the past can to a large extent be avoided.

III. THE PUBLIC HEALTH SERVICE AND POWER PRODUCTION

We propose that the second possible conflict of AEC-public interest be balanced by the Public Health Service (HEW). Without detracting whatsoever from the present health-physics and safety-engineering capability of the AEC, we propose that the PHS develop an independent Radiation Hazard Capability. With radiation problems playing an increasing part in our modern life, it is probably past time that the PHS expand its competence in this field. The department of radiation hazards would analyze and monitor radiation and nuclear processes of all kinds, but an area of particular attention would be in the operation of nuclear power plants.

The PHS should possibly have strenthened powers in the field of air, water, and land pollution, and just as in the waste discharges of industrial plants, it would monitor and keep surveillance the radiation level in power plant surroundings. Reluctantly with the AEC in such important matters as public safety should be welcomed rather than avoided. One extremely important point is that the responsible PHS department should be brought into FPC and particularly into AEC planning of power plant facilities at an early stage. Equally important to the independent monitoring of radiation hazards is the *anticipation* of emergency and safety situations.

By working in cooperative fashion with the FPC and the AEC, regulatory conflicts should not be severe. But in the case that impasses are reached between agencies, they can be worked out at the Executive branch level under the view of Congress.

IV. INSURANCE PROBLEMS

A. We recommend that the matter of public idemnity insurance for possible nuclear power plant accidents be more deeply considered. It is well known that the Price-Anderson Act of 1954, as amended, provides for public indemnification up to 500 million dollars in the case of a nuclear power plant accident. Even large private companies have admitted that they could not afford insurance premiums on this scale—even if such a sum could be guaranteed by private insurance pools (which they have said they could not). So the hard truth of the matter is that the free enterprise power companies could not build nuclear power plants if it were not for this large government insurance subsidy. The existence of this insurance subsidy creates an artificial (in the sense of interfering with a competitive economic situation) incentive to build nuclear power plants compared to other kinds of power plants.

If the Price-Anderson insurance provision for non-government builders were to be repealed, it is probable that in a few years the private insurance companies would undertake to insure small or moderate-sized boiling-water (light water) reactors. This would be probable for two reasons, first, because of reliability of the intrinsic fail-safe principle of the water-moderated reactor, and secondly, because of

the by-then-successful operation of a number of such plants which have been or are being built. The intrinsically more dangerous and less routine breeder reactors would then be built by the AEC. If, after a number of years of operation, these latter plants also proved reliable and valuable, then the private insurance costs would presumably drop low enough for private power companies to undertake the plants also.

In other words, we are pointing out that the natural regulatory action of insurance requirements would be a force in the direction of private or state power companies building only the proven-safe plants and a force in the direction of proceeding somewhat more deliberately, with time for in-depth analyses of needs, resources, siting problems and the ultimately best development techniques. On the other hand, research into design improvements and new developments cuold be pursued rapidly by the AEC.

Because of the vital role of the Price-Anderson Act in making commercial construction of nuclear power plants possible, however, it would not seem wise to repeal this Act. THEREFORE, WE RECOMMEND THAT THE PRICE-ANDERSON ACT BE AMENDED SO AS TO ALLOW THE GOVERNMENT TO CHARGE A RATE COMMENSURATE WITH THE INSURANCE RISK. The premiums should be adjusted so that they furnish an incentive for nuclear power companies to eventually obtain complete insurance coverage from private insurance companies. The purpose of the public liability laws would then be fulfilled in making the builder exercise the maximum caution with respect to risks to his company and also undertake the responsibility of his possible (though unlikely) failure in the form of a bad nuclear accident. We believe this procedure will also serve to promote public confidence in the nuclear sources of power which they will undoubtedly have to live increasingly close to in the years to come.

EPILOGUE

The Federation of American Scientists does not propose to recommend a course of action fixed in every detail. We only propose to outline the most needed improvements in our present power policy and to suggest some concrete ways of obtaining these improvements. Undoubtedly the intent of our suggestions can be furthered by altering the organizational details which have been suggested to achieve them. We would be glad to discuss further with any interested party additional means of implementing our common goals of power development. To complete our suggestions on ways in which national power resources might be most effectively developed, we append on page 3, a suggested outline of a division between State and Federal responsibility in the matter. As can be seen, the suggested division of responsibility is very much the same as in other joint State-Federal endeavors. The diagram perhaps also serves to summarize our suggested areas of improvement in present U.S. power policy.

LOS ANGELES CHAPTER,
FEDERATION OF AMERICAN SCIENTISTS
Henry Paul, M.D., Chairman
Halton C. Arp, Ph.D., Vice-Chairman
Donald E. Koch, Ad Hoc Committee on Nuclear Power
(Chapter mailing address:
1206 South Gramercy Place
Los Angeles, California 90019
(213) RE 1-3957)

PROPOSED REVISION OF POWER RESPONSIBILITIES

FEDERAL

Federal Power Commission (FPC)

1. Survey of all power resources.
2. Evaluation of different kinds of power sources.
3. Regional Planning of Grid Inter-Ties & recommended siting areas (general).
4. Experimental power facilities.
5. Evaluation of fission-fusion and role of nuclear energy in overall power development.
6. Proposals for integrated power development in U.S. and discussion with public.

Atomic Energy Commission (AEC)

(All present programs plus:)

1. Evaluation of siting requirements.
2. Evaluation of large or small plants between or in cities.
3. Phasing of fission to fusion if fusion achieved.
4. Health physics, radiation safety, engineering precautions and nuclear safety in general.
5. Encouragement of private nuclear power plant insurance coverage.

Public Health Service (HEW)

1. Department of Radiation Hazards with competence in all public radiation problems but special attention to nuclear power.
2. Strengthening of environmental pollution control with section on radiation monitoring.
3. Cooperation in power planning in order to anticipate safety problems.

STATE

Public Utilities Commission (PUC)

1. Statewide survey of power needs and resources.
2. Make public evaluation of state power sources, including nuclear power.
3. Thorough discussion of siting criteria and optimum siting conditions for power plants.
4. Publish plans of regions of power development, proposed transmission facilities and inter-ties.

Private and Community Power Companies with Cooperation of AEC

1. Cooperative evaluation by all companies of general overall direction of power development.
2. Statement of criteria which determine construction of individual plants.
3. Evaluation of effect on community of construction of specific plants.

Department of Public Health (DHP)

1. Executive powers for carrying out general HEW responsibilities on a state level.
2. Radiation monitoring and checking around nuclear plants.
3. Pollution controls on all industrial and power plants.

News Items from page 1

tion, a system whose characteristics and capabilities have been well publicized."

A Government specialist insisted that one of the principal fallacies of the Bethe-Garwin argument is that it "assumes we just sit on our hands technologically while the Chinese figure out ways to circumvent the defense." He pointed out that the Administration was asking Congress for enough R&D funds to improve the ABM system against a whole range of conceivable new threats or penetration techniques. (William Beecher in the *New York Times;* 21 March 1968. The Bethe-Garwin article, already noted as desirable reading on the ABM question by Cameron B. Satterthwaite in the

(Continued on Page 5)

FAS NEWSLETTER

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

Chairman ..... Jay Orear

The FAS Newsletter is prepared in Washington.

Editor: Harriette L. Phelps.

Approx. closing date for this issue: 10 April 1968.

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.

INTERESTING READING

"Attacking the Weapons Culture," article by Carl Behrens in *Science News*, 30 March 1968. (A profile of physicist/author Ralph E. Lapp, with some facts from his new book, "The Weapons Culture" (Norton 1968, 230 pp., $4.95—"A critical analysis of the U.S. defense industry, with glossary and 12 appendixes of tabulated data and graphs"). The point is made that "Lapp has been doing other people's homework for years. He's been adding up the numbers and coming up with answers that no one else supplies.").

"Supersonic Scandal," article by George Lardner, Jr. in the *New Republic*, 16 March 1968. (A *New Republic* —style critique of the whole SST program, for which Congress has already appropriated more than $650 million.)

"The Crisis of the Cities: the Battle We Can Win," article by James M. Gavin and Arthur Hadley in *The Saturday Review*, 24 February 1968. ("What could we achieve if Vietnam war funds were applied to domestic needs?" Based on a book, "Crisis Now," by Gavin and Hadley, to be published by Random House.)

"Nuclear Power: Suddenly Here," article by Milton Shaw and Merrill Whitman in *Science and Technology*, March 1968. (A readable article with maps, statistics and comparisons of reactor types for power generation.)

"Science, Society, Action, Reaction," guest editorial by Fred Hoyle in *Physics Today*, April 1968. (Based on Hoyle's talk at the recent Chicago meeting of the American Physical Society—noted in the February NEWSLETTER. ". . . My proposals [for involving scientists with society] for the 1970's are these: Either keep out of the mess or go right in and change it. Don't fall between; don't try faint-heartedly to change things and fail. Don't think that by merely being an adviser you will do any good at all. And, most important, realize that the changing of your own concepts may well be the hardest part of the job.")

"Science's Place in the Political Spectrum," article by Clyde C. Hall in *Technology Review*, March 1968. (More on the science-public policy dialogue: how universities can get a useful grip on problems, the inadequacies of the Congressional structure, and other topics.)

"To End War: An Annotated Bibliography and 1968 Literature Catalogue." (A February 1968 review of diverse items, divided into 12 categories; 48 pp. Available for 50¢ from the World Without War Council, 1730 Grove Street, Berkeley, California 94709.)

"The Development of Science and Technology in Underdeveloped Countries," article by S. Husain Zaheer in *Scientific World*, 1968, No. 2. (With viewpoints and examples from India, especially. *Scientific World* is published bi-monthly by the World Federation of Scientific Workers, 40 Goodge Street, London, W1; £1 per year, or 3s 6d per issue. The magazine has occasional quite interesting articles. But compared with, say, *Science* or *The New Scientist*, its overall political objectivity in selecting authors and articles could be improved.)

"The Vietnam Herbicide Experiment," article by Sheldon Novick in *Scientist and Citizen*, January-February 1968. (The author concludes that the Midwest Research Institute study done for the Defense Department (see the March NEWSLETTER) does little to remove uncertainties about the long-term agricultural and ecological effects of herbicides used in Vietnam.)

"The Implications of Military Technology in the 1970's." An Adelphi paper, 67 pp., available for 75¢ from the Institute for Strategic Studies, 18 Adam Street, London, W.C.2. (Separate articles on: Strength, Interest and New Technologies (by Albert Wohlstetter), Technology and Strategic Mobility (by J. I. Coffey), The Future of Manned Aircraft (by Christopher Hartley), Ocean Technology and Submarine Warfare (by John P. Craven), Technology and the Battlefield (by E. C. Cornford), New Communications Technologies and National Security (by Leland L. Johnson).)

"Scientific Man for All Seasons," article by Lee Edson in *The New York Times Magazine*, 10 March 1968. (An aptly-titled profile of Hans Bethe, which FAS members will enjoy and appreciate.)

"The Disunity of Science-Technology," article by Melvin Kranzberg in *American Scientist*, Spring 1968. (With historical and other arguments, the general point is made that science and technology are more distinctly different pursuits and their respective substances are less closely connected than is often assumed.)

"Arms Control and Disarmament Act Amendments, 1968," hearings held in February 1968 before the House Committee on Foreign Affairs; 259 pp. Available from the Committee (Thomas E. Morgan, Chairman) or the Government Printing Office. (Hearings on a bill, H.R. 14940, to extend the life of and authorize funds for the Arms Control and Disarmament Agency (ACDA). A good source of facts and figures for anyone following the fortunes of ACDA. But many FAS members will read the grilling of ACDA officials and various statements hostile to ACDA and its missions as gloomy indicators of a Congressional mood.)

"Doing Something About the Weather—in a Big Way," article by Lawrence Lessing in *Fortune*, April 1968. ("Advanced computers and new techniques of weather watching may extend accurate forecasts weeks ahead. An immense international effort is underway to gather the knowledge needed." A highly-readable article with lots of facts, by Fortune's leading science writer.)

"Peaceful Atoms Only, Please," article on some dilemmas of Japanese policy in *Science News*, 20 April 1968.

"Can the World Be Saved?" article by LaMont C. Cole in *The New York Times Magazine*, 31 March 1968. (Cole, a professor of ecology at Cornell, has adapted his article from an AAAS speech. "The answer isn't quite an unequivocal no—but in seeking a 'better way of life,' man is destroying the natural environment essential to any life at all.")

"There is Peril, Too, in Growing Technology," article by Walter Sullivan in the *New York Times;* Sunday News Review, 24 March 1968. (Mostly a report from the recent conference—noted by Leonard S. Rodberg in the March NEWSLETTER—at the State University of New York near Albany; with comments from a wide range of knowledgeable people on a wide range of problems.)

"AEC Authorizing Legislation—Fiscal Year 1969." Hearings in January and February before the Joint Congressional Committee on Atomic Energy. (Voluminous source materials on AEC programs and related subjects. Available from the Government Printing Office, Washington, D.C. 20402; Part 1 (926 pp.) for $2.75, Part II (1182 pp.) for $3.50. The Joint Committee report, following the hearings and dated 3 April 1968, recommends $2.618 billion for the AEC in fiscal 1969.)

NEWS ITEMS (Continued from Page 3)

February NEWSLETTER, is highly recommended to FAS members interested in this subject. Bethe and Garwin were able to go farther in addressing some specific technical questions—such as radar "blackout" resulting from nuclear explosions— relating to ABM effectiveness than other authors have apparently done so far in the open literature. —H.L.P.)

* * * * * *

James D. Watson, author of "The Double Helix," is the new director of the Laboratory of Quantitive Biology at Cold Spring Harbor, Long Island. At least until the publication of his recent highly personalized and biting account of the discoveries that led to the understanding of structure of DNA, Watson was known chiefly among scientists as one of the three men who had shared the Nobel prize for that historic work. Although Watson said he would retain his post as a Harvard professor, it is known that his relations with the Harvard administration have been cool for some time, even before the publication of "The Double Helix."

Watson reportedly hopes to convert the famous Cold Spring Harbor Laboratory, which has been declining in recent years, into a major center for basic cancer research and training. "I'm looking for someone who would like to give $5 million to cancer and restoring old buildings," he said. Cold Spring Harbor is a respected and venerable institution in whose buildings, some dating back to the town's prosperous 19th century whaling days, the scientific revolution of the 1940's and 50's leading to our present understanding of complex molecules and their role in life processes was greatly accelerated. Watson commented, with respect to Cold Spring Harbor, that "I didn't want to see it disappear. So I agreed to become its Director." To Watson, Cold Spring Harbor apparently represents a challenge that Harvard no longer presents. "It's something new," he said. "Besides my colleagues in Harvard are much brighter than I am."

Watson suggested that the solution to cancer lies in a fuller understanding of what happens after viruses enter cells. At Cold Spring Harbor some years ago it was shown that when a virus infects a bacterial cell, it injects its genes into the host, which then incorporates the virus' genetic information into its own. Watson and other scientists hypothesize that the same process is involved in the transformation of a normal human cell into a cancer cell, so that the search for a means of preventing cancer must depend more on fundamental research in molecular biology and perhaps less on clinical work by medical scientists. "Cancer research has to move into pure science," Watson remarked. (Robert Reinhold in the *New York Times;* 28 March 1968)

* * * * * *

Fifty engineers have been elected to membership in the National Academy of Engineering. The four-year old affiliate of the National Academy of Sciences now has 237 members altogether. Like the NAS, it is charged with advising the Federal Government in policy matters relating to science and engineering.

Among the newly elected members of the NAE is Harvey Brooks of Harvard who was cited for, among other things, "leadership in national technological decisions." (*New York Times;* 1 April 1968)

* * * * * *

The National Institutes of Health will be reorganized and strengthened to play a larger national role in medical education and the dissemination of medical knowledge. This major step in reorganizing the health activities of the Department of Health, Education, and Welfare (HEW) represents an attempt to change HEW's basic strategy in dealing with the nation's needs in medical education and research, in the delivery of health services, and in coping with disease and environmental problems. These needs have been changing rapidly and, in important respects, intensifying, under the impact of new research developments, rising medical costs, and growing shortages of doctors and nurses.

NIH, the Government's main research arm in the biomedical sciences, will now incorporate the Bureau of Health Manpower and the National Library of Medicine. A new agency to be called the Health Services and Mental Health Administration will be responsible for many functions previously assigned to various agencies in the Public Health Service. A major constituent of this new agency will be the National Institute of Mental Health, which was detached from NIH some time ago. Also as a part of the new organization, the Public Health Service will include the Food and Drug Administration.

The expanded role of NIH is seen as a strong departmental vote of confidence for the Institutes' administration under Dr. James A. Shannon. It is thus, perhaps, indirectly a reply to strong criticisms of the Institutes' management made last year by the Intergovernmental Relations Subcommittee of the House Committee on Government Operations. The new reorganization follows plans worked out by John W. Gardner before his resignation as HEW Secretary on March 1st. (*New York Times;* 1 April 1968)

* * * * * *

The Soviets may be testing a maneuverable rocket stage that could be used to guide bombs down from orbit. Three Russian payloads launched in recent months have performed maneuvers not seen before. Observers in Washington are paying close attention to these flights, in October and December of last year, and in March of this year. Their attention is heightened because of Moscow's apparent clandestine development in 1966 and 1967 of the so-called fractional orbital bombardment system (FOBS). Some observers fear that the recent Russian shots may represent a step upward from FOBS to a so-called MOBS—multiple orbit bombardment system—which Soviet officials have occasionaly mentioned in public since 1961.

It is understood that there is no strong evidence now to link the recent launchings to the development of FOBS. The stationing of warheads in orbit would violate the treaty on outer space, whereas the FOBS does not because its payload—technically at least—does not remain aloft long enough to be considered in outer space. It is also considered possible that the new Soviet maneuvering satellites may be experiments aimed at inserting instrumented spacecraft into orbits around the moon. Others think it will be used for some new, more versatile, Soviet reconnaissance satellite. But there is general agreement that once meaneuverable rocket stages have been thoroughly developed, they can be used for any of various missions, including directing weapons-carrying satellites to specific targets. (*New York Times;* 3 April 1968)

* * * * * *

A "significant degree of control" over human intellectual capacities may be possible within five to ten years, a psychologist has predicted. David Krech, Professor of Psychology at the University of California at Berkeley, told a Senate subcommitte that society should start thinking about this possibility before it is too late. Krech declared that "I foresee the time when we shall have the means and therefore, inevitably, the temptation to manipulate behavior and the intellectual functioning of all people through environmental and biochemical manipulation of the brain." He said that this kind of control had already been demonstrated in animal experiments, citing chemicals that can improve the memory, and the problem-solving ability of laboratory animals. He claimed that some of these drugs can raise a hereditarily stupid animal up to the performance level of brighter animals of the same species. Among the drugs is strychnine, a poison in large doses, but a stimulant to the central nervous system in small doses, and various synthetic compounds similar to strychnine. Krech emphasized that all the research to which he was alluding applied only to rats, mice, and goldfish, and that his predictions were based on extrapolations to man.

Krech testified before the Government Research Subcommittee of the Senate Government Operations Committee. The subcommitte is chaired by Senator Fred R. Harris (D.-Okla.) and is consideraing the legislation introduced by

NEWS ITEMS

Walter F. Mondale (D-Minn.) to set up a national Commission on Health, Science and Society. (*New York Times;* 3 April 1968. See also the News Item on the Mondale Commission in the March 1968 NEWSLETTER)

* * * * * *

Soviet physicist Lev Landau died in Moscow on April 2nd at the age of 60. Landau, one of the world's leading theoretical physicists, won the Nobel prize for his pioneering work in low temperature phenomena. He had never completely recovered from injuries suffered in an automobile accident six years ago. At that time, Landau lay in a coma for some months and the Soviet Government assembled an international team of medical specialists to save his life.

Hans Bethe of Cornell extolled Landau as "one of the greatest theoretical physicists in our time," and other scientists accorded him similar tributes. Landau had received many honors from the Soviet Government. But just before and during the early years of World War II Landau was apparently in serious trouble with the Stalinist authorities and was jailed for a year. Reportedly, he was released only after Peter Kapitsa, a friend and then Stalin's chief scientific advisor, protested personally to the Kremlin. Kapitsa, it is said, threatened to refuse to work unless Landau was discharged from prison. (*New York Times;* 3 April 1968)

* * * * * *

Frederick Seitz, President of the National Academy of Sciences, will become the new president of the Rockefeller University. Seitz, 56, will succeed Detlev W. Bronk, who is retiring at the age of 70 on July 1st. Seitz will divide his time between the Academy in Washington and Rockefeller in New York until early next year when he will move to Rockefeller on a full-time basis. A new president of the Academy will be elected later this year by its 800 members.

Rockefeller University now has 134 graduate students. It admits only 20 or 30 new students each year, grants each at least a $3,500 fellowship annually, and awards only Ph.D. degrees. Before Bronk came to Rockefeller in 1953, the institution did not enroll students nor grant degrees. Since then, however, it has broadened into a university, combining instruction with research in a wide range of scientific problems, including animal behavior, cell biology, genetics, and other mostly biological areas. In the last 15 years its annual budget has risen from $2.7 million to $16.3 million and its present endowment is about $200 million. (*New York Times;* 4 April 1968)

* * * * * *

In 1966 there were 243,000 scientists in the United States, according to the National Register of Scientific and Technical Personnel published by the National Science Foundation. Of these 243,000, 92% were men, 37% had a Ph.D., 27% a Master's, and 20% a Bachelor's degree. Basic research was the primary occupation of only 16%, with 13% in applied research, 18% in teaching and 20% in management and administration. Educational institutions employed 36%, industry 34%, and the U.S. Government 10%. Six percent were "unemployed." Median annual salary was $12,000. The largest fields were: chemistry 27%, biological sciences 12%, and physics 12%. (NSF Publication 68-9, March 1968)

* * * * * *

"Heavy" artificial chemical elements are becoming much more abundant and may promise new practical uses. These elements which are durable, compact sources of energy are now mostly being produced in special reactors built by the AEC. Large quantities of some elements are expected to be obtained in the future as byproducts of nuclear power plants and underground nuclear explosions. They are envisioned as compact long-lived power supplies for spacecrafts and under-water laboratories, for implanting in the body for artificial organs, and as radiation sources for medical diagnosis and treatment. These possibilities are beginning to appear as nuclear technology becomes more sophisticated and as some new insights into the chemical behavior of the artificial elements emerge.

AEC Chairman Seaborg, who received a Nobel Prize for his work with trans-uranic elements, predicted that certain isotopes of these elements would soon be available by the ton. This contrasts with the traditional state of affairs in which isotopes could only be produced in such minute quantities and decayed so rapidly that the most sophisticated physical and chemical techniques were required to determine their properties.

The predictions for practical uses are based on various relatively stable isotopes of atomic numbers 93 to 100. Many of these have half lives of the order of weeks. Among the most interesting isotopes, so far as practical applications are concerned, are californium-252, curium-244, americium 241, neptunium-237, and plutonium-238. Californium-252 is interesting because large radiation fluxes can be obtained from very small quantities, remote from heavy machinery or reactors. Plutonium-238 is already in production for use as a power source on space missions, and there are suggestions that it could well be used to power artificial hearts and heart stimulators. Neptunium-237 has a half-life of two million years, making it extraordinarily stable by trans-uranic standards, and Seaborg estimates that about 440 pounds of it would be available every year by 1975 as a by-product from nuclear power plants.

The AEC is spending about $35 million a year on the development of radioisotope power supplies. It justifies this expenditure through belief that the trans-uranic isotopes will eventually prove to be the most economical source of compact, long lived power. (*New York Times;* 9 April 1968)

FAS NEWSLETTER

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

Volume 21, Number 4 April, 1968

Second Class Postage Paid at Washington, D. C.

Return Postage Guaranteed