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MINUTES

of the

SEVENTY-SIXTH MEETING

of the

ADVISORY COMMITTEE FOR BIOLOGY AND MEDICINE

U. S. ATOMIC ENERGY COMMISSION

September 18, 1959 - HQ, Germantown, Md.
September 19, 1959 - 1717 H St. N. W.

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The 76th meeting of the Advisory Committee for Biology and Medicine, U. S. Atomic Energy Commission, was held on September 18 and 19, 1959 at AEC Headquarters and 1717 H St. N. W., Washington, D. C. The meeting was attended by Committee members Drs. H. Bentley Glass, Robert F. Loeb, Leonidas D. Marinelli, Harland G. Wood, and John C. Bugher, the Vice Chairman, who presided. Dr. Charles L. Dunham, Director, Division of Biology and Medicine, and various members of his staff were present at the open sessions.

The Minutes of the 75th meeting were adopted with minor alterations. The next meeting is to be held at Oak Ridge on November 20-21, 1959, to visit the Oak Ridge Institute of Nuclear Studies and the AEC-University of Tennessee Agricultural Research Laboratory. The ORINS Advisory Board will be urged to send a representative. The following meeting was tentatively scheduled for January 8 and 9, 1960 at Hanford.

The Committee was grieved to learn of the recent death of its Chairman, Dr. Simeon T. Cantril, and, by its instruction, the following letter of condolence was sent to Mrs. Cantril by the Vice Chairman:

October 6, 1959

Dear Mrs. Cantril:

As members of the Advisory Committee for Biology and Medicine of the U. S. Atomic Energy Commission, we wish to express to you our sympathy in the death of Dr. Cantril and our own grief in the loss of our associate and personal friend. To each of us he was not only an esteemed colleague and scientist, but was at the same time a counselor who combined patience and wisdom with a selfless devotion to the welfare of our country.

Beginning with the wartime period, Dr. Cantril had been continuously associated with the medical aspects of the atomic energy program to the great benefit to the national effort. His experience and knowledge in radiology made him an invaluable advisor in the establishment of high standards of safety in atomic energy operations and in the practical applications of radiation in medicine.

Dr. Cantril's professional work lay primarily in the radiation treatment of cancer, and he will long be remembered for his contributions in this field. The Tumor Institute of the Swedish Hospital in Seattle owes much of its standing today to his scientific vision and untiring efforts.

We share your sadness in his untimely death; we also wish to express our gratitude to you whose love and devotion made so many of his accomplishments possible.

As a small token of our regard, we are planning to make a contribution to the Tumor Institute which we feel would be particularly appropriate and which we very much wish to do.

Sincerely yours,

(signed) John C. Bugher

John C. Bugher, M.D.
Vice-Chairman

and Committee members:

Charles H. Burnett
H. Bentley Glass
James G. Horsfall
Robert F. Loeb
L. D. Marinelli
Harland G. Wood

Mrs. Simeon T. Cantril

It was decided to ask Dr. Charles H. Burnett, whose 6-year term ended with the present meeting, to continue for another two years in order to act as Chairman. At the end of that period, Dr. Burnett's extra term would end and another Chairman would be elected from the Committee's membership.

To fill the vacancy created by Dr. Cantril's death, the Committee recommended the following radiologists: first, Dr. Henry Kaplan of Stanford University; second, Dr. Fred J. Hodges of the University of Michigan; third, Dr. Richard Chamberlain of the University of Pennsylvania.

The business of the 76th meeting fell under four major general headings: new administrative agencies, scientific and educational programs, fallout and defense, and news from abroad.

1. New Administrative Agencies

A. Federal Radiation Council

Dr. Dunham reviewed the present status of the Federal Radiation Council, established in August by the President. Mr. Arthur S. Flemming,

Secretary of Health, Education and Welfare, was designated Chairman by the President on August 22, 1959. Other members of the Council are the Secretaries of Defense and Commerce, and the Chairman of the AEC. The Special Assistant to the President for Science and Technology, Dr. George B. Kistiakowsky, is advisor to the Council. The Council appointed Dr. Donald R. Chadwick, a career officer in the PHS, as Secretary. The immediate objectives of the Council are to define the general problem of radiation safety and to survey activities of the various agencies that are now dealing with it. The PHS is specifically charged with the collation, analysis, and interpretation of pertinent data.

Meanwhile, Congress has passed P.L. 86-373 dated September 23, 1959 which awaits the President's signature. This law sets up a Federal Radiation Council with one additional member (Secretary of Labor) and defines the function of the Council much as in the President's Executive Order. It is expected that the President will sign the bill, and a report will be made to DBM on the functioning of the new Council when it is initiated.

B. Office of Health and Safety

Mr. R. E. Hollingsworth, AEC Deputy General Manager, discussed the functions of the newly created AEC Office of Health and Safety, of which Dr. Forrest Western has been made Acting Director. The office is to serve a staff policy function; it is not an operational or programmatic group. It is to be responsible for developing policy and health standards for the protection of the public and of personnel in AEC operations (especially pertaining to fire, radiation, waste disposal, etc.), serving as a focal point for relationships with State government officials. It will recommend to the Commission the policies to be established after doing the necessary staff work.

2. Scientific and Educational Programs

A. Function of National Laboratories

The Congressional Joint Committee on Atomic Energy will hold hearings on the functions of the national laboratories early in 1960, and to this end has requested information and advice from the Commission. It appears that the Committee's intent is to make constructive and adequate long-range plans for the efficient use of the national laboratories. Mr. David Saxe of the AEC Chicago Operations Office has been assigned the duty of making a staff report for the Commission. He has also been

instructed to consider the relation between the programs of the national laboratories and other AEC-supported groups, and of the entire AEC program to those of other agencies.

Of the 21 major laboratories under specific review, the following are engaged in biological research: Argonne Cancer Research Hospital, Argonne National Laboratory, Brookhaven National Laboratory, Hanford Laboratories, Lawrence Radiation Laboratory at Berkeley, Los Alamos Scientific Laboratory, National Reactor Testing Station, Oak Ridge National Laboratory, Oak Ridge Institute of Nuclear Studies, and the University of Rochester. Each of these establishments has a government financed plant valued at more than $2 million. ACBM suggested that, owing to their special importance, Health and Safety Laboratory (New York Operations Office), The Atomic Bomb Casualty Commission and the UCLA programs be included in the survey.

The objectives of Mr. Saxe's report will be the following: To state what have been the leading objectives and to consider, on the basis of past experience and general analysis, whether or not these should be changed; to state how such objectives should be accomplished; to state what is being done at present; to state what levels of effort or support may be anticipated as desirable during the next decade, both in the national laboratories and in other establishments such as universities.

Among the specific questions involved are the following: Should national laboratories be used primarily for inter-disciplinary programmatic research? To what extent should the whole AEC program be programmatic? Is it desirable to support institutes at the universities? Is it desirable to place major emphasis on the support of those who teach? To what extent should the AEC support research in general? How can the supply of investigators in radiobiology be made adequate to the needs?

Mr. Saxe stated that he would send a draft report to ACBM members by about October 15, 1959, and would like to have comments in time for presentation of a report to the Commission very soon thereafter.

B. Program in Quantum Biology

Dr. L. G. Augenstine (biophysicist, Biology Branch, DBM), presented a memorandum for a proposed biophysics program for DBM in quantum biology (i.e., those processes involved in the absorption and transfer of radiant energy by atoms and molecules of biological importance). Dr. Augenstine

emphasized that few quantum chemists were interested in this specific area and consequently the opportunity for biologists to learn about it or to enter into collaborative studies was almost nil. ACBM believes that such work should be encouraged and supported. Methods for doing this were discussed. The forthcoming Bioenergetics Symposium at Brookhaven in October, organized as a result of the interest of the Biology Branch (DBM), was considered a useful step. It was agreed that established investigators in the universities who needed additional support in this field should be helped, especially if such help would promote the training of additional investigators. Whether or not DBM should attempt to support a university institute for this purpose was discussed at length and will be considered again. Meanwhile, in the consideration of the proposal for such a project at the University of Florida, Dr. Harland Wood will represent ACBM at the site visit. It was pointed out by Dr. Glass that the decision to establish such an institute should be in line with the general policies elaborated in the broad study now in progress of national laboratory function and overall program.

C. Miscellaneous

The Radiation Biology Summer Institute Program, jointly financed by the AEC and the National Science Foundation, was successfully carried out during 1959 at 18 of 19 institutions, and their contracts will be renewed in 1960 (Dr. Shilling).

At the next Program Directors' meeting, the DBM will request that each specific research project provide a 200-word summary of its plans. These summaries, also to be made in the future whenever a new project is funded, will be sent to the Biological Sciences Information Exchange. The summaries for the present year will be used by DBM, which plans to publish compilations for genetics, oceanography, and whole-body counter (Dr. Shilling).

Dr. Walter D. Claus is assisting Senator Humphrey's Committee (U. S. Senate Committee on Government Operations, Subcommittee on Reorganization and International Organizations), by making a survey of radiobiological research in the United States.

3. Fallout and Defense

A. Short-Lived Isotopes and Fallout Exposure

In response to AEC Chairman McCone's request, ACBM will prepare

a statement on the importance of short-lived isotopes in fallout that can be used by the Commission to answer certain questions asked by Senator Clinton P. Anderson, Chairman, Joint Committee on Atomic Energy.

Dr. Gordon M. Dunning and Mr. Hal Hollister presented the problem. The fallout hazard has been largely estimated in terms of such long-lived isotopes as Sr-90 and Cs-137. To what extent do short-lived isotopes such as I-131, Ba-140, Sr-89, and Cs-144 contribute to the hazard?

The problem is complicated by the factors of (1) fractionation, (2) the relative amounts initially deposited in the stratosphere and troposphere, and (3) the decay constants of the isotopes.

As an aid in approaching the problem, Dr. Dunning calculated values of what may be called the short-lived contribution factor, F, such that

Short-lived exposure = F • Cs-137 exposure.

Values of F were calculated for Cs-137 activity determined at various times after detonation and for integrated exposures over 30 and 70 years (see table).

It appeared from the discussion that the short-lived contamination could be greater than originally thought, but the matter will require further study before ACBM can make a statement. Dr. Dunning and Mr. Hollister together with Drs. Bugher and Marinelli are to consider the matter.

Ratio: Short-lived isotopes/Cs-137

Exposures	Troposphere		Stratosphere					
	2 weeks	4 mos.	1/2 yr.	1	2	3	5	10
30 yr.	12	9.7	3.4	2.1	1.1	.79	.48	.26
70 yr.	8	6.3	2.2	1.3	.74	.52	.33	.18

B. Hiroshima and Nagasaki Dosage

It had been urged about 18 months ago that the Los Alamos group recalculate the radiation fields from the Hiroshima and Nagasaki weapons.

This information in conjunction with the Icheban dosimetry studies would allow a much better estimate to be made of the exposures in Japan and thereby greatly facilitate important aspects of the ABCC program.

Dr. Dunham reported that Dr. N. Bradbury of Los Alamos recently informed General Alfred D. Starbird that, in effect, the Los Alamos group did not know when they could do this work. The ACBM again requested that this important work be undertaken in the near future by the Los Alamos group.

C. Biomedical Aspects of Nuclear Propulsion

Col. C. M. Barnes (Aircraft Nuclear Propulsion) and Col. J. A. Connor (Aerospace Nuclear Safety) of the Division of Reactor Development reviewed some of the physical and medical problems related to the use of atomic energy for aircraft and satellites.

4. News from Abroad

A. Civil Defense in Europe

Prof. H. C. Bowman of the Drexel Institute, consultant to the Division of Biology and Medicine in the field of civil defense, reported on his visits in Europe during the summer of 1959. The varied policies with respect to building shelters in the four countries visited were striking and provide some perspective for viewing the lack of positive action here.

Great Britain. The primary interest is in fallout. The shielding factor of the average house (reduction in exposure) was found to be greater in value than 1/40 for about half the population in 10 major cities; communal buildings will be used to shelter this half of the population. A 7-mile fallout monitoring grid is being established over the country. They are the most advanced in using small-scale models to study mock attacks.

Sweden. The basic philosophy is to evacuate all but 10% of the population, which will remain for purposes of essential services. For the temporary shelter of most of the population and the long-term shelter of 10%, large shelters are being constructed in rock with 15 meters of top cover; 15 shelters are already completed, the largest of which, in Stockholm, can hold 20,000 persons. All of these shelters are in peacetime use, and it is said that their rent will cover about one-third of the cost. The program uses about $1.00 per annum per citizen of tax money. In addition, by law every new building of three

stories or more must include a shelter that can withstand the collapse of the building.

West Germany. This country does not regard evacuation as a solution. Shelters have not been constructed, although plans have been developed and models tested at Nevada in 1945-57. These shelters will survive when the people within them will not.

France. No positive action has been taken. They are satisfied with the results of the Nevada tests of their plans.

In each country, Prof. Bowman received the complaint that the exchange of information between them and us was poor. Our reports should be sent regularly to these foreign agencies.

B. Brazil - Radioecology

Dr. Bugher reported on his visit to the region of Vitoria, Espirito Santo, located in that area of the Brazilian coast where the background is 10 times that usually found. It was the opinion of Dr. Bugher and his associates (Drs. T. Parran and Shields Warren) that Brazil should institute a small-scale study of the population, especially with respect to infants and children, beginning with the people in the town of Guarapari, and that future plans should be contingent on this experience. Owing to Brazil's great shortage of foreign exchange, ACBM agreed that it might be desirable for the project to receive some dollar support from DBM for special equipment and foreign travel. The application could be handled through the International Atomic Energy Agency.

Respectfully submitted,

Henry I. Kohn

Scientific Secretary
Advisory Committee for Biology
and Medicine