

MINUTES

of the

EIGHTY-NINTH MEETING

of the

ADVISORY COMMITTEE FOR BIOLOGY AND MEDICINE
U. S. ATOMIC ENERGY COMMISSION

December 8-9, 1961

University of California
Lawrence Radiation Laboratory
Berkeley, California

and
Radiological Laboratory
San Francisco, California

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The 89th meeting of the Advisory Committee for Biology and Medicine, U. S. Atomic Energy Commission, was held at the Lawrence Radiation Laboratory, University of California, Berkeley, and at the Radiological Laboratory, University of California Medical Center, San Francisco, on December 8-9, 1961. Committee members present were Drs. John C. Bugher, Chairman, H. Bentley Glass, Vice-Chairman, Fred J. Hodges, Robert F. Loeb, James H. Sterner, Harland G. Wood, and Leonidas D. Marinelli. The meeting was attended by Dr. Charles L. Dunham, Director, DBM, and various members of his staff.

The next meeting of ACBM will be held January 12 and 13, 1962, at AEC HQ, Washington, D. C.

The business of the meeting is summarized under four headings:

1. Lawrence Radiation Laboratory Program in Biology and Medicine
2. Proposed Bio-Medical Accelerator
3. Radiological Laboratory Program
4. Miscellaneous Items

1. Lawrence Radiation Laboratory (LRL) Program in Biology and Medicine

The program in biology and medicine of the LRL, much of which is carried out in the Donner Laboratory on the Berkeley Campus, was reviewed on December 8. Made available to Committee members were (1) Abstracts of research projects prepared for the meeting of the Bio-Medical Program Directors, February 6-7, 1961; (2) The "Bio-organic Chemistry Quarterly Report" (UCRL-9900), October 17, 1961; (3) "Semiannual Report, Biology and Medicine" (UCRL-9897), October 1961.

Under the chairmanship of Dr. John H. Lawrence, Director of the Donner Laboratory, 20 investigators gave 15- to 20-minute talks on representative research projects. The speakers and topics were as follows:

Isotope turnover studies by means of the whole-body counter -
Thornton W. Sargent

Chemical elements of the blood of man - John W. Gofman

Studies of total fat, water and protein - William E. Siri

Some factors involved in the homeostatic regulation of body
fluid volume - Ernest L. Dobson

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Successful bone marrow and organ transplantation following selective lymphatic irradiation with Y^{90} -DTPA - Myron Polycove

Importance of erythropoietin in human blood diseases - Donald C. Van-Dyke

Immunochemical studies of human erythropoietin - John C. Schooley

Primary and cosmic solar radiation - Burton J. Moyer

Accelerators and biophysical research - Cornelius A. Tobias

Some aspects of the use of heavy ions in molecular and cellular radiobiology - Tor Brustad

Analysis of a developing biologic structure by neutron activation - James S. Beck

Electron microscopy of irradiated *Tribolium* - Thomas L. Hayes

The effect of radiation on the nervous system - Cornelius T. Gaffey

Heavy ion irradiation to the pituitary for various clinical states - John D. Constable

Radioiodine 123 and other short-lived radioisotopes for diagnosis - William G. Myers

Research program of the Bio-organic Group - Richard M. Lemmon

Photosynthesis of carbon compounds - James A. Bassham

Architecture of the photosynthetic apparatus - Roderic B. Park

The physics of quantasomes - Gaylor M. Androes

Alkaloid bio-synthesis and function - Henry Rappaport

2. Proposed Bio-Medical Accelerator

The Committee considered the present status of the proposal to build a bio-medical accelerator at the LRL. In addition to Dr. Edwin M. McMillan, Director, and Dr. John H. Lawrence, a number of staff members of the Donner Laboratory and LRL were present, as well as Dr. Dunham and members of ACBM.

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Dr. Elmer Kelly, who has had the responsibility for the design of the accelerator, stated that the requirements set forth by the biologists could be met under the following conditions. A hilac accelerator would produce stripped nuclei with energies up to 10 Mev per nucleon. These particles would be led into a synchrotron ring, within which they could be accelerated to a maximum energy of 500 Mev per nucleon. The energy of the stripped nuclei entering the synchrotron and those accelerated within it could be varied over a considerable range below the maximum energy obtainable. Such a machine would require five years to build and would cost \$ 16 million. Another \$ 4 million was estimated as the cost for the building to house it. The operating expense would be approximately \$ 2 million per annum. Laboratories that might be required for the biological experiments would have to be constructed at an additional cost.

The case for the accelerator was presented by Dr. Lawrence and Dr. Cornelius Tobias. Various fields of research were mentioned in which they proposed that the machine could be used. In the course of the discussion, Dr. McMillan, Director of LRL, stated that the argument for building the accelerator must rest entirely on its utility for purely biological research. He stated that the program in the physical sciences of the LRL did not need such an instrument.

Dr. Dunham, at the close of the discussion, in answer to a question from Dr. Lawrence, suggested LRL continue to develop a formal proposal relative to the building of the accelerator and the research program to be developed around it, which could then be acted on by the appropriate officials of the AEC.

3. Radiological Laboratory Program

The Radiological Laboratory, University of California Medical Center, San Francisco, was visited on the afternoon of December 9. Under the direction of Dr. Robert S. Stone, the Laboratory carries out investigations in three major fields. (1) Dr. Stone reported on the study under his direction dealing with the x-ray treatment of cancer patients with the beam from the Laboratory's 70-Mev synchrotron. (2) Dr. Gail D. Adams reported on his work in the field of x-ray dosimetry. (3) Studies with experimental animals relating to "Age at exposure and the delayed effects of irradiation" as reflected by changes in the life table, the bone marrow, and the kidney, and to "Radiation genetics" were reported on by Drs. Donald Bailey, Paul H. Guttman, Henry I. Kohn, and Frederic C. Ludwig. The annual report of the Laboratory (UCSF-21), November 1961, was distributed to the Committee members.

4. Miscellaneous Items

Budget Information: Dr. Dunham reported that the 1963 Budget of \$ 70 million has been reviewed by the Bureau of the Budget. The entire base program

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was accepted without modification, including the radiobotany program to be developed at Brookhaven. Among the rejected items were the following: the food irradiation program, the grant program under training and education, and construction items considered to be improvements or renovations rather than to house new projects. Dr. Dunham expressed his satisfaction with the Bureau's action and his belief that certain rejected items for construction would meet with approval in the following year.

Project Chariot: Dr. J. N. Wolfe notified the Committee that the present target date for Project Chariot is sometime in September or October of 1964. Plans are being made to have a pre-shot survey of the entire area. It is now anticipated that the fallout cloud will be directed toward the sea and that it will curve back to land to the south, where at present there are no baseline ecological data. *(Mail in File: MILITARY Res. + APPN - 5 TESTS)*

Public Health Service: Dr. Dunham reported that Dr. Frank Weber, Chief of the Division of Radiological Health, has retired, and that Dr. Donald Chadwick, previously the Secretary of the Federal Radiation Council, has been appointed to succeed him. Dr. Chadwick will be present at the next meeting of ACBM in order to discuss some of his plans.

Lawrence Award: At the request of the Commission, ACBM has nominated three men for the Lawrence Award. In order of preference they are: Dr. Andrew A. Benson, Dr. Henry Gomberg, and Dr. Cornelius Tobias.

Staff Changes: Dr. Dunham reported on a number of changes in DBM that have occurred recently. The post of Assistant Director for Biological Sciences and Chairman of the DBM Research Committee, recently left vacant by Dr. Zelle, who has become Professor of Genetics at the University of Washington, Seattle, will be filled by Dr. John Totter, formerly with the Biology Branch of DBM, and who is at present Professor of Chemistry at the University of Georgia. Dr. Totter will resume his connection with DBM in July 1962.

Mr. Robert Corsbie, Chief of Civil Effects Branch, has resigned after 10 years with DBM in order to resume the private practice of architecture. A note will be sent by Dr. Bugher expressing ACBM's appreciation for Mr. Corsbie's services.

Mrs. Virginia Bolton, who has been in charge of the training and education program for DBM, is transferring to another agency. Dr. Bugher will also send a note to her expressing appreciation for her work in the Division.

Letters of Condolence: Letters are to be sent to
widow Chief of Radiological Physics

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and Dosimetry Branch, DBM, and to
whose wife died recently.

, former Chairman of AEC,

Respectfully submitted,

Henry I. Kohn, M.D.
Scientific Secretary, ACBM

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