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MINUTES

ADVISORY COMMITTEE FOR BIOLOGY AND MEDICINE

SIXTEENTH MEETING

Held at

Atomic Energy Commission

Washington, D.C.

June 11, 1949

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MINUTES

Advisory Committee for Biology and Medicine

June 11, 1949

The sixteenth meeting of the Advisory Committee for Biology and Medicine of the Atomic Energy Commission was held at the AEC Building, Washington, D. C., with the Chairman, Dr. Alan Gregg, presiding.

Attendance

ATTENDANCE

Members of Committee

- Dr. Alan Gregg, Chairman
- Dr. E. W. Goodpasture, Vice Chrmn
- Dr. G. W. Beadle
- Dr. A. Baird Hastings
- Dr. J. T. Wearn
- Dr. E. C. Stakman

Dr. D. W. Bronk was unable to be present

Atomic Energy Commission

- Dr. Henry DeWolf Smyth
- Mr. J. Volpe, Jr.
- Mr. Bennett Boskey
- Mr. Robert Tumbleson

Division of Biology
and Medicine

- Dr. Shields Warren
- Dr. John Z. Bowers
- Dr. James H. Jensen
- Dr. L. S. Taylor
- Dr. P. B. Pearson
- Dr. L. W. Tuttle
- Dr. James H. Sterner
- Dr. George V. LeRoy
- Mr. L. Joe Deal
- Mr. Mike DeMatteis
- Mrs. F. R. Montgomery

U. S. Navy

- Capt. Harry Haight

Minutes of
Meeting of
April 8 & 9,
1949

Minutes of Meeting of April 8 and 9, 1949. The minutes of the last meeting (April 8-9, 1949) were approved unanimously on a motion made by Dr. Gregg and seconded by Dr. J. T. Wearn.

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Report on Support of Research Projects. The following research projects that had been approved by the Division of Biology and Medicine since its last meeting were reviewed with interest and the Committee expressed commendation of the staff for their efforts in screening the projects.

Report on
Research
Projects

a. Projects approved.

To Oak Ridge:

- (1) Duke University - Drs. Philip Handler, J. S. Harris, Paul J. Kramer and Karl H. Wilbur.
 - a. AEC Fellowship Training Program (Handler) - \$17,537; 7/1/49 to 6/30/50.
 - b. Metabolic Studies with Radioisotopes (Handler) - \$16,148 - 8/1/49 to 6/30/50.
 - c. Studies of Electrolyte and Fluid Balance in Health and Disease (Harris) - \$8,245 - 7/1/49 to 6/30/50.
 - d. Study of the Absorption of Phosphorus by Pine Seedlings (Kramer) - \$1,228 - 7/1/49 to 6/30/50.
 - e. (1) Shell Formation in Molluses and Barnacles as Studied by Radioisotopes.
(2) The Isolation and Membrane Permeability of the Liver Cell Nucleus (Wilbur) - \$10,434 - 7/1/49 to 6/30/50.
- (2) Bowman Gray School of Medicine - Dr. G. T. Harrell -
 - a. Distribution and Turnover of Sodium and Potassium in Acute Infections (Harrell) - \$13,075.
 - b. Hormonal and Pharmacological Actions on the Formation of Tissue Phospholipides (Dr. C. Artom) - \$12,120.
 - c. Toxicity of P-32 as Related to the Functional Capacity of the Liver - (Drs. Artom, Harrell and Cayer) - \$3,135 - 7/1/49 to 6/30/50.
- (3) University of North Carolina - Dr. P. Costello - "Radiation Effects on Salamander Larvae" - \$5,547 - 12/12/49 to 12/12/50.

To Chicago Office:

- (1) University of Chicago - Dr. C. Philip Miller - "The Bacteriological Aspects of Radiation Sickness" - \$28,000 - 1 yr. duration.



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- (2) Henry Ford Hospital - Dr. F. W. Hartman - "Chemical Sterilization of Blood and Plasma with Nitrogen Mustards" - \$12,900 - 1 yr. duration.
 - (3) University of Minnesota - Dr. S. W. Hunter - Investigations on the Use of Zirconium as a Radioopaque Media" - \$6,050 - 1 yr. duration.
 - (4) Battelle Memorial Institute - Dr. K. S. Chester - "Use of Radioactive Indicators in the Study of the Mode of Action of Fungicides" - \$23,500 - 4/1/49 to 4/1/50.
 - (5) University of Illinois - Drs. B. C. Johnson and H. E. Carter - "The Metabolism of Vitamins and Their Interrelationships with Amino Acids" - \$4,800 - 6/1/49 to 5/31/50.
 - (6) University of Minnesota - Dr. E. C. Stakman - "The Effects of Radioactive Substances on Plant Pathogens and Other Microorganisms" - \$39,900 - 7/1/49 to 6/30/50.
 - (7) University of Chicago - Dr. Roy E. Zirkle - "Purchase of Electrostatic Generator for Use on 'Microbeam' Effects Study Being Conducted Through ONR" - \$103,500.

To New York Office:

- (1) University of Rochester - Dr. Herman Pearse - "Research on Thermal Effects of the Atomic Bomb" - \$87,250 - 1 yr. duration.
- (2) Harvard University - Drs. R. F. Sognaes & J. H. Shaw - "Further Studies on the Metabolism of the Teeth with Special Regard to Radioisotope Studies on the Enamel" - \$12,250 (Trsf'd. fm ONR) - 1 yr. duration.
- (3) Massachusetts General Hospital - Dr. J. H. Means - "Research on Radiation Effects on Thyroid Function" - \$23,000 - 1 yr. duration.
- (4) University of Rochester - Dr. W. F. Bale - \$17,600 - "Biological Effects of External Radiation (X-rays and Gamma Rays) - 1 yr. duration.
- (5) Massachusetts Institute of Technology - Dr. A. A. Thomas - "Efficiency of Present Water Treatment Methods in Removing Radioactive Substances from Water" - \$50,000 - 4/1/49 to 4/1/50.

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To Santa Fe Office:

- (1) Cedars of Lebanon Hospital - Dr. Paul E. Rekers - "Relationship of Flavanoid Structures to Radiation Protection" - \$17,500 - 1 yr. duration.
- (2) University of Colorado - Dr. I. Goodman - "Metabolism of Nucleic Acid Derivatives" - \$28,530 (Trsf. from ONR) - 7/1/49 to 6/30/50.
- (3) Washington University - Dr. D. Lipkin - "Study of Nuclear Acids, Nucleoprotein and Nucleotides and Related Organic Phosphorus Compounds" - \$18,000 - 1 yr. duration.
- (4) University of Kansas - Dr. R. E. Stowell - "Cytochemical, Microchemical and Biophysical Study of Tumors and Effects of Radiation Upon Cells" - \$36,000 - 1 yr. duration.

To Hanford Office:

- (1) University of Washington School of Medicine - Dr. C. A. Finch - "Isotope Study in Iron Metabolism" - \$13,100 - 1 yr. duration.

To AEC, Washington, D. C. Office:

- (1) National Research Council - "Cataract Investigations" - \$30,000.

b. Proposals extended since April 8-9 meeting:

To Oak Ridge Office:

- (1) Baylor University - Dr. J. H. Gast - "Chemistry and Metabolism of Some Sulfur Oxides" - \$13,000; Original grant \$15,200 - Total - \$28,200 (Trsf. from ONR)
- (2) Rice Institute - Drs. A. C. Chandler and R. V. Talmadge - "The Nutrition of Tapeworms. The Physiological Action of Relaxin in Mammalian Reproduction" - (Trsf. from ONR) - \$19,700; Original grant \$35,850 - Total \$55,550 - 7/1/49 to 6/30/50.

To Santa Fe Office:

- (1) University of Colorado - Dr. Theodore Puck - "Study of Bacteriophage and Radiation Mechanisms" - (Trsf. from ONR) - \$39,000; Original grant \$46,264 - Total - \$85,264

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- (2) University of Colorado - Dr. J. R. Lacher - "The Infra-red Absorption Spectra of Nucleic Acids, Amino Acids and Related Compounds" - (Trsf. from ONR) - \$5,120; Original grant - \$28,935 - Total \$34,055. 7/1/49 to 6/30/50.

To Hanford Office:

- (1) University of Oregon - Dr. P. L. Risley - "Localization of Radioactive Isotopes in Germ Cells and Reproductive Tissues during Quiescence and Activation" - (Trsf. from ONR) - \$14,000; Original grant - \$18,842 - Total \$32,842.
- (2) Reed College - Drs. A. F. Scott, Hungate and Livermore - "Postdoctoral Training in Basic Sciences; Application of Radioactive Tracer Technique in the Field of Cellular Metabolism; Biological Synthesis of Peptibond" - (Trsf. from ONR) - \$33,670; Original grant - \$32,465 - Total - \$66,135.

c. Proposals declined since April 8-9 meeting:

- (1) University of Pennsylvania - Dr. E. R. Long - "Use of Trace Elements in the Study of Metabolism of M. Tuberculosis".
- (2) York Uni-Bellevue Medical Center - Dr. Anthony A. Albanese - "Study of the Long Term Radiation Effects of Internally Administered Beta Emitters".
- (3) Chicago Medical School - Dr. Richard G. Roberts - "Storage of Hemin and Other Metalloporphyrins in Normal and Neoplastic Tissues".
- (4) Biological Laboratory, Inc. - Dr. Norman Molomut - "The Effect of Anti-Splenic Tissue Serum in Radiation Damage".
- (5) Russell Sage College - Dr. Gertrude Heidenthal - "Radiation Work on the Parasitic Wasp, Habrobracon".
- (6) Battelle Memorial Institute - Dr. K. Starr Chester - "Monitoring Radiation with Living Plants and Microorganisms as Detectors".
- (7) Amherst College - Dr. H. E. Plough - "Biochemistry and Nutrition of Unicellular Organisms and the Requirement of Varieties or Mutants Induced by Radiation".

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- (8) Brown University - Dr. H. B. Chase - "Radiation and Tracer Studies in Biology".
- (9) Northwestern University - Dr. I. M. Klotz - "Physiochemical Study of the Mode of Action of Antibacterial Agents".
- (10) Haskins Laboratories, Inc. - Dr. S. H. Hutner - "Toxicity and Antibiotic Betatron of Compounds Forming Complexes with Metals and Effect of Trace Elements on Bacterial Metabolism".
- (11) University of Pittsburgh - Dr. P. Gray - "Permeability of Natural Membrane to Gases and Ions".
- (12) Alabama Polytechnic Institute - Dr. R. W. Engel - "Nutritional Edema and Anemia as Influenced by Choline".
- (13) Oberlin College - Dr. G. T. Scott - "Binding Properties of Intra-Cellular Constituents".

Support of
Basic
Research

Support of Basic Research. The broad subject of the appropriate scientific fields in which the Atomic Energy Commission should support research projects in biology, medicine and biophysics was thoroughly discussed.

Dr. Warren reviewed the program as to the scope of research that had been initiated, wherein attention had been primarily focused on projects dealing with the effects of ionizing radiation on protoplasm in its various manifestations, contamination and decontamination problems and selected application of radioactive isotopes.

Dr. Bowers outlined the present procedures in screening projects and means by which information is placed before interested persons to familiarize them with the research fields of interest.

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[REDACTED]

Dr. Warren stated that announcement of the research program had been made periodically in the Journal of the American Medical Association and in Science. It was his belief also that the wide distribution of the special edition of Nuclear Science Abstracts, which contains material from the projects that the Division is primarily interested in is the best source of disseminating information on the research program.

The Committee recommended that a summary of all research projects that have been approved by the Division be prepared, including a statement as to the duration of each contract for consideration at their next meeting. This summary will enable them to evaluate the program as to the fields of research that should be considered in the future. The Committee further recommended that each investigator should be advised at the time of the inception of his contract that if the work progresses satisfactorily and worthwhile results are paramount that he may reasonable expect a renewal of the contract. This statement would enable each investigator to plan forward financing of his program.

Foreign Distribution of Radioactive Isotopes. The Director reviewed the foreign distribution of radioactive isotope program placing the following statistics in the record concerning the international distribution of radioactive isotopes.

[REDACTED]

INTERNATIONAL DISTRIBUTION OF RADIOISOTOPES

(First 20 Months, September 3, 1947 to April 30, 1949)

Isotopes Available and Shipments Made

<u>Isotope</u>	<u>No. of Shipments</u>
Antimony-122	
-124	
-125	
Argon-37	
Arsenic-76	
-77	
Bromine-82	
Calcium-45	11
Carbon-14	40
Chlorine-36	
Cobalt-60	16
Copper-64	
Gold-198	
-199	
Iodine-131	117
Iron-55	(27
-59	(
Mercury-197	
-203, 205	
Phosphorus-32	254
Potassium-42	
Silver-110	
-111	
Sodium-24	

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<u>Isotope</u>	<u>No. of Shipments*</u>
Strontium-89	7
Sulfur-35	26
Zinc-65	

*Total shipments of all isotopes for which no figures are given is 15, representing 85.3 millicuries.

Countries Using Radioisotopes

(First 20 Months, September 3, 1947 to April 30, 1949)

Argentina	Mexico
Australia	Netherlands
Belgium	New Zealand
Brazil	Norway
Canada	Peru
Chile	Spain
Columbia	Sweden
Cuba	Switzerland
Denmark	Turkey
Finland	Union of South Africa
France	United Kingdom
Guatemala	Bermuda
Iceland	British West Africa
India	England
Ireland	Uruguay
Italy	

After a full discussion, the Committee unanimously recommended that the following endorsement of the Foreign Distribution of Radioactive Isotopes program should be forwarded to the Chairman for information.

"The Advisory Committee for Biology and Medicine has reviewed from the standpoint of biology and medicine the United States program for the foreign distribution of radioisotopes. It is our understanding that more than 90% of the shipments thus far sent abroad have been for uses in medical therapy and in scientific research in biology and medicine.

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We have also considered the suggestions which have been advanced that the uses to which these radioisotopes might be put could possibly be disadvantageous to the security of the United States.

The Advisory Committee for Biology and Medicine believe that the foreign radioactive distribution program for diagnosis, therapy and research in biology and medicine is advantageous to the United States and helps in assuring the broad scientific progress which is so important to our national welfare. The Advisory Committee for Biology and Medicine strongly endorses continuation of the foreign distribution program."

Los Alamos Los Alamos. The Deputy Director reported on his recent studies of the existing and proposed biological, medical and biophysical programs at Los Alamos. He stated that a closer connection between the Health Division in the laboratory and the staff of the hospital is needed. However, it is not deemed advisable to attempt to place the hospital under the direction of the University of California but rather to attempt to develop the hospital as a community enterprise with a Board of Governors from the citizens of Los Alamos.

It was the opinion of the Committee that it would be advantageous to secure a highly qualified physician as Chief of Professional Services as well as a hospital superintendent trained in hospital administration.

It was recommended that these appointments be held in abeyance until Dr. Rufus Rorem has completed his study, sometime in July, of the medical care program at Los Alamos.

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Colorado Plateau

Colorado Plateau. The Deputy Director further reported on the industrial aspects of the uranium program in the United States including the mining and processing activities in the Colorado Plateau.

The Committee recognized the need for the Commission to consider the extent of its responsibility in these activities as it is apparent that in many of them there are levels of injurious agents which exceed those considered to be safe from the health standpoint.

Sixth Semiannual Report

Sixth Semiannual Report. Dr. Warren reviewed the status of the Sixth Semiannual Report to the Congress which is focused primarily on biology and medicine.

Health Hazards in Certain AEC Areas. Dr. James H. Sterner, Consultant to the Division of Biology and Medicine and Chief of Industrial Medicine at the Eastman Kodak Company, gave an oral report on his survey of the health hazards in certain AEC areas and in facilities producing and processing uranium. Dr. Sterner will consult with members of the staff of the Division from time to time on health problems at the installations.

Fellowship Program

Fellowship Program. Dr. Warren presented the factual background on the fellowship program, including a summary of the hearings before the Joint Congressional Committee on Atomic Energy.

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Foreign Scientists at Training Courses at Oak Ridge.

Foreign
Scientists
at Training
Courses at
Oak Ridge

Dr. Warren spoke of the interest displayed by foreign scientists in their attending the Institute of Nuclear Physics at Oak Ridge for training in techniques for handling isotopes.

Senate Appropriation Hearing. The Director reported on

Senate
Appropriation
Hearing

the hearings before the Senate Appropriation Committee. He stated that it is proposed that the funds allocated to the AEC will be reduced by 15% and furthermore, if such a deduction is made, it will be impossible to start the radiobiology building at Argonne.

Civil Defense. The Director told the Committee of the

Civil
Defense

recent actions of the Division pertaining to Civil Defense; i.e., a letter to the National Security Resources Board with offer of facilities of AEC that are available, and of the Weapons Effect Handbook that will give factual information relating to the atomic bomb explosion.

The Committee was concerned as to the responsibility which the Commission considers desirable for them to assume and they reiterated their request that they would appreciate definitive clarification on this problem.

The Committee was of the opinion that the Director of the Division should discuss the problem with the General Manager with a view to bringing this problem to a focus at an early date.





It was moved by Dr. Wearn, seconded by Dr. Stakman and unanimously approved that this recommendation be forwarded to the General Manager.

Ad Hoc Committee - Future Tests. Dr. George V. LeRoy

Ad Hoc
Committee-
Future
Tests

presented a summary of the meeting held on June 7, 8, and 9, 1949 of the Ad Hoc Committee for planning future biological tests. This Committee consisted of the following members: Dr. George V. LeRoy, Chairman, Dr. Raymond E. Zirkle, Dr. Jacob Furth, Dr. Wallace D. Armstrong, Colonel James P. Cooney, Captain R. H. Draeger, Dr. D. B. Dill, Dr. Sam L. Clark, Dr. Arnold H. Sparrow and Dr. Leon Jacobson.

Dr. LeRoy stated that forty proposals for test projects were considered and twenty-one of the proposals accepted. These were arranged into a ten-point test program as follows:

1. Animal breeding colony to provide enough animals of three "calibrated" species for testing.
2. Study of acute radiation injury to fill in the gaps of pathologic studies in Japan and Bikini, with particular attention to pathological-physiological disturbance during the first week.
3. Study of thermal injury to supplement earlier studies and to provide abasis for treatment of AB thermal injury.



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4. Study of blast injury to keep resolve discrepancies previously noted between AB blast effect and HE blast effect.
5. Study of hematology to extend previous studies and to provide a basis for rational therapy of acute radiation injury.
6. Study of particulate FP to evaluate hazards to aviators, rescue workers, etc.
7. Biological Dosimetry
8. Study of genetical effects using a few well-studied species of microorganisms and plants.
9. Observations on local indigenous fauna and flora.
10. Dosimetry with mineral substances to evaluate certain materials for personnel monitoring.

A tentative plan for the construction of a suitable laboratory to conduct the test program was submitted to the ad hoc committee and they strongly recommended that the animal colony and the laboratory be adjacent to one another on the same island.

Chicago Toxicity Laboratory. The Director presented a memorandum from Dr. Franklin McLean, Director of the Chicago Toxicity Laboratory, in which he suggested that the contract between the University of Chicago and the Chemical Corps be cancelled for Fiscal Year 1950 and a direct contract be entered into by the Atomic Energy Commission with the

Chicago
Toxicity
Laboratory

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University of Chicago for administering the Chicago Toxicity Laboratory.

The Committee unanimously affirmed the Director's recommendation that in order to have the full cooperation of the Chemical Corps and of maintaining close liaison with the Armed Services, that the present contract should be renewed between the University of Chicago and the Chemical Corps.

Dr. McLean further suggested the establishment of an atomic energy unit to study the military implications of the biological and medical aspects of RW in the Chemical Warfare Service Medical Division at Edgewood.

The Committee endorsed Dr. Warren's recommendation that it would not be feasible to take the initiative in such a program.

Subcommittee
on Human
Allocation

SubCommittee on Human Allocation. Dr. Warren advised the Committee that Dr. Harold Copp of the University of California at the instance of Dr. Joseph Hamilton has been asked to serve as a member of the Subcommittee for Human Allocation.

Membership
of ACBM

Membership of Advisory Committee for Biology and Medicine. Dr. Hastings proposed that the membership of the Advisory Committee for Biology and Medicine should be a rotating

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one. Many suggestions were offered as to rotating the membership over a period of years and it was decided to discuss the matter and form a policy at the meeting to be held in September.

The next meeting of the Advisory Committee for Biology and Medicine will be held in Washington September 9-10, 1949.

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