

MINUTES
ADVISORY COMMITTEE FOR BIOLOGY AND MEDICINE
THIRTY-FIFTH MEETING

Held in
Washington, D. C.

January 9 and 10, 1953

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MINUTES

ADVISORY COMMITTEE FOR BIOLOGY AND MEDICINE

January 9 and 10, 1953

The thirty-fifth meeting of the Advisory Committee for Biology and Medicine was held at the Atomic Energy Commission in Washington, D. C. on Friday and Saturday, January 9 and 10, 1953.

<u>Attendance</u>	Committee Members:	Dr. Alan Gregg, Chairman Dr. Edward A. Doisy Dr. Gioacchino Failla Dr. Curt Stern Dr. Shields Warren
	Staff of Division of Biology and Medicine and AEC:	Dr. John C. Bugher Dr. Charles L. Dunham Dr. Walter D. Claus Dr. Paul B. Pearson Dr. Harold H. Plough Dr. Paul G. LeFevre Dr. Karl M. Wilbur Dr. Gordon Dunning Mr. Howard C. Brown, Jr. Mr. Douglas L. Worf Mr. L. Joe Deal Mr. Robert L. Corsbie Mr. Robert L. Dutenhoff Mr. James F. Haggerty Mr. Herbert A. Stanwood Mr. Beverly Thompson, Jr. Mrs. Frances R. Montgomery, Secretary

Friday, January 9, 1953:

Minutes of Meeting held at the
AEC in Washington, D.C. on
September 12 and 13, 1952

The Chairman convened the meeting at 9:00 a.m. The draft minutes of the thirty-fourth meeting of the Advisory Committee for Biology and Medicine were placed before the Committee by the Chairman.

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A motion was made by Dr. Failla, seconded by Dr. Stern, and approved unanimously that the paragraph on "Foreign Travel" (page 5) should be corrected to read as follows:

"Dr. Bugher requested the views of the Committee on the amount of support that should be afforded members of the staff of the various laboratories by the Division of Biology and Medicine for foreign travel."

In this connection, Dr. Stern brought out that in the travel of individuals to foreign countries a distinction should be made between an individual desiring to visit laboratories and an individual desiring to attend a congress, especially where the individual is to present a paper. Dr. Gregg commented that if the individual is going to present a paper at a congress, all of his expenses would be met, in most instances, and that if there had to be a choice between two individuals, he would favor the selection of the younger man.

Dr. Failla stressed the desirability of foreign travel. He suggested that when individuals had something to contribute that would enhance the standing of the Division of Biology and Medicine of the Atomic Energy Commission, that person should be given preference. Dr. Failla further stated that he thinks it would be preferable not to pay all the expenses of such a trip but to expect the individual to make some contribution of his own.

Therefore, after a full discussion it was the sense of the Committee that arrangements for foreign travel should be

considered as rather flexible and not be held rigidly to a firm rule of one person per year per major unit and that the individual selected should be regarded as representing the Atomic Energy Commission whether or not all of his expenses are to be paid by funds from the Atomic Energy Commission.

With the above correction made, the minutes were approved unanimously upon a motion by Dr. Warren and seconded by Dr. Doisy.

Research Projects

The discussion on the research projects was opened by Dr. Bugher, Dr. Dunham, Dr. Pearson, and Dr. Claus.

The Committee was particularly interested in the work now being carried on at the University of Rochester under the supervision of Dr. Louis Hempelmann. The report was summarized by Mr. Haggerty and covered the following subjects, namely: (1) water tolerance of irradiated rats; (2) the effect of liver injury on the mortality of irradiated rats; (3) the urinary excretion of desoxyribonuclease in irradiated rats; (4) the plasma and urinary amino acids in irradiated dogs; and (5) blood changes in rabbits.

Clinical experiments are in progress on: (1) urinary corticoids in radiation therapy patients; (2) eosinophil counts in radiation therapy patients; (3) physiological changes in irradiated skin or lung of therapy patients; and (4) late follow-up of children whose thymuses were irradiated in infancy.

Animal experiments in progress include: (1) a study of the free glycine pool and the rate at which glycine

enters the free glycine pool in irradiated and normal rats; (2) blood flow in irradiated tissue; (3) tissue breakdown in adrenalectomized and non-adrenal rats exposed to total and partial body irradiation with X-rays; and (4) inhibition of mitotic activity and chromosome fragmentation produced by irradiation of mice.

It was stated that due to Dr. Hempelmann's former connections with the Atomic Energy Commission programs, the University of Rochester had waived the overhead charge on this project; however, the University of Rochester stated that this was not to be considered as a precedent.

In reference to the Sloan-Kettering Institute contract, Dr. Dunham reported that Dr. C. P. Rhoads has complied with the request of the Division by supplying all the additional information required regarding his current budget.

In connection with the over-all discussion of the projects, Dr. Gregg pointed out that when a staff member of the Division visits a project it is important that the project be brought to the attention of an appropriate representative of the University's administration. It was his view that if this procedure is followed there will not be any possibility for the investigator to feel that he has no responsibility to the University nor they to him with respect to the project.

The Committee reiterated their previous view that the Commission should be advised from time to time that the research activities of the Division of Biology and Medicine are now widely

spread throughout the United States and that they are not concentrated in the eastern part of the United States, and furthermore, that research contracts have been awarded to colleges and universities in all but four states of the Union.

Dr. Bugher led the discussion on the modes of entry to worthy investigators in small institutions. He stated that many small institutions are not aware that support is available for research purposes, and they usually suffer from a feeling that they would not be able to obtain an audience if they attempted to make the necessary contacts.

The remarks that followed brought out the following suggestions: A short article could be placed in Science periodically pointing out that the Atomic Energy Commission (Division of Biology and Medicine) is desirous of receiving applications for research projects. Likewise, such an announcement could be made in the Journal of the American Association of University Professors, the American Association of Land Grant Institutions, and similar journals. In addition, it was further suggested that an article of some length be placed in Science from time to time summarizing the contracts that have been accepted by the Division of Biology and Medicine and what has been accomplished under the sponsorship of the Atomic Energy Commission.

A list of the projects approved during the month of December, 1952 is attached as appendix A.

I.B.M.

Dr. Bugher reported on the status of the analysis of our research program from the standpoint of the utilization of punch cards (I.B.M.). He described the equipment and explained the codes

for the analysis of the scientific projects that are being established as well as the codes for the financial and the functional budgets.

A survey of the equipment was made by the Committee and a demonstration of its operation was very ably presented by Miss Rosemary Elmo.

Visit to National Bureau of Standards

The Committee visited the National Bureau of Standards on Friday afternoon to review the work that is being sponsored by the Atomic Energy Commission. They expressed many favorable comments on the manner in which Dr. H. V. Astin, the Director of the Bureau, and Dr. L. S. Taylor, the Chief, Atomic and Radiation Physics Division, have organized the work. They had planned an interesting itinerary, and a summary of each program was presented. The program is attached as Appendix B.

Saturday, January 10, 1953:

Reactor Accident - Chalk River

The Chairman reconvened the meeting at 9:00 a.m. Dr. Bugher opened the session by reporting on the reactor accident at Chalk River. In connection with this report he stated that a study of the accident is now being made by a selected group from Atomic Energy Commission installations from which will emanate a full report to the Commission. It was brought out that in all probability the reactor will be shut down for at least six months or longer.

Wahluke Slope

Dr. Bugher advised the Committee that the Commission has taken action to release a relatively small amount of the

Wahluke Slope area at Hanford. The area to be opened consists of approximately 87,000 acres. He stated further that this information will be given to the public by a press release from the Atomic Energy Commission, and it will state very frankly the hazards which exist in the Hanford area if farm families do settle on the newly released lands.

Biological Station at
Eniwetok

The desirability of establishing a small biological station at Eniwetok for continuing and extending the biological work in the test area was discussed by the Committee.

Dr. Wilour led the discussion, and he stated that since 1947 the Division of Biology and Medicine has sponsored a program of study of the radioactive contamination of plants, fish, and other marine animals of the Bikini and Eniwetok areas. This has been carried out by biologists from the University of Washington who have made several expeditions to these areas for the collection of material for later analysis at Seattle. For continuing the biological studies in the test area, it would seem desirable to utilize existing facilities at Eniwetok as a permanent biological station. This would permit a closer study of contamination of water and land areas from test activities and waste disposal and would make possible for the first time fundamental biological studies related to the ecology and food resources of that area of the Pacific.

It was pointed out that an existing building on Perry Island would be used to provide working space for a few biologists from Atomic Energy Commission laboratories and universities who might

wish to carry on studies in the area. It is proposed to limit the initial activities of the station to modest proportions with annual operating costs at a level not to exceed \$20,000 until the success of the station has become firmly established.

The Committee suggested that plans for a biological station at Eniwetok be further investigated with a view toward its establishment, and that a staff paper on this subject be prepared for consideration by the Commission.

Status Report of Over-all Programs

Dr. Bugher oriented the Committee on the over-all programs and the work of the Division during the past year. The Branch Chiefs described the individual programs in Medicine, Biology, Health Physics, Civil Defense, Radiation Instruments, and Program Analysis which included the budget estimates, and reported on the progress and problems connected therewith. Of major interest was the report on the survey that was made to determine the present status of the relatively new radiation instruments industry. It was brought out that of the 75 companies in the field most of them making radiation instruments, (34 replies have been received) it was found that 6 companies are grossing over a million dollars. That sales have increased from slightly less than four and a half million dollars in 1948 to an expected gross to exceed twenty million dollars in 1952. The employment has grown from 130 people in 1944 to around 2400 in 1952.

Emphasis on the Various Aspects of the Research Program

Dr. Bugher opened the discussion, and among the problems that he outlined wherein emphasis was being placed was the work on the biological effects of

neutrons. He stated that this has been made possible in part by the results of the GREENHOUSE test. Many programs were summarized. The Committee commented freely, and they made several suggestions wherein research could be strengthened. They strongly urged that additional work should be initiated on the radioactive particle problem. It was also suggested that it would be well to investigate the question of the protective material in the spleen and bone marrow preparations.

Civil Effects Test Program and
Biomedical Test Program

Mr. Corsbie, who has been named Director of the Civil Effects Group of the Test Organization, with the assistance of Dr. Plough and Dr. Claus summarized the preliminary plans for the Civil Effects Test Program for the UPSHOT-KNOTHOLE operation. Mr. Corsbie explained the programs in detail and he stated that a great deal has been accomplished in the program through the Biomedical Test Planning and Screening Committee and the Structural Screening and Planning Committee. The Committees have examined all of the proposals, and they have passed on them as to their merit and whether or not the work was necessary, whether or not it had been done previously, and whether it could be achieved in some way short of a field test.

The Committee was greatly impressed with the proposed plans and expressed the opinion that the staff had been wisely selected for carrying out such a vast program.

Next Meeting

It was agreed that the thirty-sixth meeting of the Committee should be held at the Argonne National Laboratory on Friday and Saturday, March 13 and 14, 1953.

The meeting adjourned at 3:50 p.m.

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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

February 6, 1953

Mr. Gordon Dean, Chairman
U. S. Atomic Energy Commission
1901 Constitution Avenue, N. W.
Washington, D. C.

Dear Mr. Dean:

The Advisory Committee for Biology and Medicine held its thirty-fifth meeting in Washington on January 9 and 10, 1953.

The agenda included a visit to the National Bureau of Standards where, we understand, the Atomic Energy Commission supports research in the amount of approximately \$821,791 annually. Since \$312,726 of this investment goes for the support of Biology and Medicine sponsored research, we were pleased to have an opportunity to inspect the facilities. Our impression was a favorable one. The quality of the research is excellent. Its pertinence and applicability to AEC problems will, of course, be partially dependent on the amount of personal attention given it by its AEC sponsors. The close proximity of these excellent facilities afford an enviable opportunity, it seems to us, for those technically inclined persons on the Washington staff, temporarily exiled to administration, to "keep their hand in."

You will recall that in our last communication to you on December 28, 1952,* reporting on our December 5-6 meeting at Brookhaven, we mentioned that due to the absence of several members at that meeting, action on certain items was deferred and that a combined report would be submitted on the December and January meetings. Of the many matters discussed, two items seem particularly noteworthy. Both were considered at the December meeting.

As a result of its special interest in Brookhaven National Laboratory the Division of Biology and Medicine has kept the Committee informed of significant developments in laboratory management and planning. We were aware, therefore, and our inspection of laboratory facilities during our visit there — tended to confirm, that BNL was rapidly approaching a crossroads where a decision would have to be made--whether to attempt a program of rehabilitation of the temporary buildings which now house many critical parts of the laboratory, or to

*Secretariat Note: On file in Division of Biology & Medicine.

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replace the former Camp Upton structures with new and permanent buildings. The decision to build permanent structures would admit of a somewhat longer productive life of the laboratory than would rehabilitation. Since either alternative would involve a sizeable capital outlay, which could be justified only if Brookhaven were meeting the needs of the northeastern universities and of the AEC, we invited Dr. Lloyd V. Berkner, President of the Associated Universities, Inc., to speak to us on that point at the December meeting. He reported that during 1952 he had visited all the Presidents and administrative officers of the universities represented on the Board of Trustees of AUI. A universal sense of permanence was found, he said, which would justify thinking of a long range plan for the replacement of the present temporary structures. A clue as to the degree to which Brookhaven has insinuated itself into the scientific life of the northeastern universities is to be found in the fact that scientists no longer have to be urged to take advantage of the laboratory's facilities during the summer, but because of the physical limitations of the laboratory the staff must now pick and choose among those eligible to be invited. We understand that the Board of Trustees of AUI has instructed Dr. Berkner to obtain from each participating university a statement, signed by the President of each, as to the usefulness and value of Brookhaven in their academic patterns. Copies of these statements are to be provided Dr. Bugher.

The other matter discussed at the December meeting had to do with research grants. As you know, we have been debating for over a year now the pros and cons of increasing overhead allowance on grant-like research contracts, and whether or not the requirement of joint participation should be continued. Somewhat reluctantly we have come to the conclusion that it is a moot question. First of all, any increase in overhead allowance, or decrease in the requirement of joint participation, would simply mean diverting to university administration funds now going directly into research. Within the present and forecast budget ceilings such a result would not only be of questionable desirability, but might be rather awkward to defend. The argument that unless some relief is forthcoming to hard-pressed universities research will suffer, is not without some validity. We wonder, however, whether the broad problem of financial aid to higher education might more properly be a matter for the consideration of the Congress.

For still another reason we have been reluctant to advise the Division of Biology and Medicine to consider in their grant program the social and economic aspects of higher education: we are told that over 90% of the institutions holding biology and medicine research contracts have voiced no objection to the distinction made between research grants--where participation is expected of the institution and a fixed overhead allowance of 8% is contributed by the AEC--and the purchase of research by

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the Commission, in which case actual costs are fully reimbursed. There are, of course, situations in which such a distinction cannot be nicely drawn and an administrative judgment must be made. In practice, however, this refined rule of thumb seems to have worked very well, and while there has been some resistance to accepting it, there has been no difficulty in applying it.

Our next meeting is to be held at the Argonne National Laboratory on March 13 and 14, which dates we hope will coincide with the dedication of the new Argonne Cancer Hospital.

Very truly yours,

/s/

Alan Gregg, M.D.,
Chairman, Advisory Committee
for Biology and Medicine

B.

MEETING WITH
 ATOMIC ENERGY COMMISSION
 ADVISORY COMMITTEE
 ON
 BIOLOGY AND MEDICINE
 AT
 NATIONAL BUREAU OF STANDARDS
 JANUARY 9, 1953

12:00 Luncheon at Tilden Gardens

1:15 Assemble in Lecture Room, Materials Testing Laboratory.
 Greeting and opening remarks by Dr. A. V. Astin, Director,
 National Bureau of Standards.

- * 1. Remarks about General Program of Radiation Physics Laboratory L. S. Taylor, Chief
Atomic and Radiation
Physics Division

General program of laboratory and reference to the more complete outline of April 1952. Work of the National Committee on Radiation Protection. New facilities being added: Betatron Laboratory Annex, Radioactivity Building, Penthouse on High Voltage Laboratory, Radioisotope Handling Laboratories in Materials Testing Laboratory. Relationship of AEC supported programs with other programs.

- 2. Radiation Data (AEC Project 2958) and (Penetration and Diffusion of High Energy Radiations) U. Fano, Chief
Nuclear Physics Section

The whole activity of this section constitutes actually a single large project, whose cost amounts to roughly 120,000 dollars in this fiscal year. Its objective is to strive towards comprehensive, detailed and continued theoretical treatment of the project of high energy radiation through matter and of its successive transformations. Only a minor portion of the necessary basic knowledge is available; its analysis, evaluation, and dissemination constitutes by itself a major task. The evaluation and dissemination actually is supported by the Biology and Medicine programs to the extent of \$21,000 (Project 2958, Radiation Data).

* Approximately 10 minutes will be taken at each of the discussions or stops indicated.

3. Radon Testing Laboratory L. L. Stockman and
G. M. Temmer

This laboratory is concerned with the testing of room air and breath samples for the presence of radon. The assays of ores and sludges are also carried out (AEC Project 2908).

4. Alpha Ray Measurement Laboratory G. M. Temmer

This laboratory calibrates alpha ray standards chiefly for use with monitoring instruments. In addition, equipment is available for the resolution of alpha rays of various energies and an investigation is also being carried out into the development of scintillation crystal counting equipment for the determination of the radon content of room air and breath samples.

5. Radioisotopes Laboratory H. H. Seliger

The function of this laboratory is to standardize artificially prepared radioactive nuclides and it chiefly relies upon the method of 4π counting. The routine distribution of P-32 and I-131 standards every three months is a regular part of this laboratory's program and it is hoped soon to set up standards of a great many other isotopes including Na-24, Sr-90, Au-198 and Tl-204.

An ionization chamber is also to be used for the routine standardization of gamma ray emitters.

6. Beta Ray Applicator Program (AEC Project 2955) T. I. Davenport

Using an extrapolation type ionization chamber in conjunction with a vibrating reed electrometer, a standard method for the measurement of RaD+E and Sr-90 beta ray ophthalmic applicators has been set up. Preliminary results have been inter-compared with Dr. Failla's laboratory in New York and with the National Research Council Laboratory in Ottawa. The only discrepancy which exists is that arising from the varying criteria adopted by the different laboratories regarding the area of the applicator to be measured.

Radiation Physics Laboratory

7. Radiation Monitoring System (AEC Project 2971) L. Costrell, Chief
Nucleonic Instrumentation
Section

This project is for the development of a system for the monitoring of fall out from atomic bomb bursts. Several remotely located detector stations are interrogated over a radio link by the operator at the control station. In response to this interrogation, the detector stations radio the desired data back to the control station where it is displayed visually and also automatically stamped on a digital recorder.

8. View of Main Laboratory Bay.

9. Film Dosimetry (partly supported by AEC Project 2921) and (Photographic Emulsion Sensitivities) G. Ehrlich

Investigation of emulsion properties and processing procedures, development of a dosimeter designed to measure the prompt radiation from an atomic explosion, and intercomparison of the present personnel monitoring services of the various AEC health physics installations.

10. Evaluation and Testing of Radiation Instruments (AEC Project 2921) F. H. Day

Study of new types and developmental prototypes of radiation detecting and measuring instruments including energy dependence, dose rate dependence, and over-all operational characteristics. The calibration of dosimeters and survey meters using 7-curie Cobalt-60 sources as well as the 500 and 1400 kv X-ray generators.

11. Cavity Ionization (partly supported by AEC Project 2909) F. H. Attix

Study of cavity ionization chamber response as a function of wall material and photon energy leading to development of secondary standard and strongly energy dependent chambers.

12. Measurement of Very Soft and High Intensity X-rays F. H. Day

Low energy guarded-field ionization chamber used for determining chamber design criteria as well as for regular calibration of instruments in the 5 - 50 KV range and at dosage rates up to 100,000 roentgens per minute.

13. Magnetic Spectrometer (AEC Project 2961) J. Motz

This instrument measures absolute intensity of spectral distribution by determining the number of Compton electrons ejected in the forward direction from a thin beryllium foil. It is now set up to measure the spectra from a 1400 kv X-ray tube.

14. Electron Tube Studies (AEC Project 2910) H. O. Wyckoff, Chief
Radiation Physics
Laboratory

Studies of the interaction of electrons with matter. Current problems include depth dose in different atomic number materials and distribution of ionization in gases.

15. Positive Ion Tube (AEC Project 2910) and
(Neutron Attenuation, AEC Project 2968) R. S. Caswell

This instrument is presently being converted from a 0.5 ma 200 kv proton source to a high intensity neutron source. It will be used first to determine the attenuation of monoenergetic high energy neutrons in water.

16. Radiation Attenuation Studies
(AEC Project 2909) H. O. Wyckoff

Present problems include the attenuation of betatron radiation and the oblique attenuation of Cobalt-60, Cesium-137 and gold-198 gamma rays.

Betatron Building

18. 50 Mev betatron, 180 Mev synchrotron. Studies of high energy X-ray interactions with matter. Personnel protection recommendations in new NCRP handbook for high energy electron accelerators.
- a. X-ray spectrometer measurements of the energies of high energy X-ray photons. (H. W. Koch, Chief, Betatron Section)
 - b. Calorimeter measurements of X-ray beam intensities.
(J. McElhinney)
 - c. Concrete attenuation studies. (H. W. Koch)
 - d. Energy dose rate measurements in water using anthracene scintillation crystals. (H. W. Koch)