

*With corrections as
passed,
43*

M I N U T E S

57th MEETING OF

A. E. C. ADVISORY COMMITTEE ON BIOLOGY AND MEDICINE

709139/712157

PLACE: *Washington, D. C.*

DATE: *September 21 and 22, 1956*

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The fifty-seventh meeting of the Advisory Committee for Biology and Medicine was held at the AEC "H" Building, Washington, D. C. on September 21 and 22, 1956. The meeting was convened at 1:30 p.m. with Dr. Shields Warren, Vice-Chairman, presiding because of the absence of Dr. G. Failla due to his recent illness. The following persons were present:

A D V I S O R Y C O M M I T T E E

Dr. Shields Warren, <i>Vice Chairman</i>	Dr. Simeon T. Cantril
Dr. John C. Bugher	Dr. H. Bentley Glass
Dr. Charles H. Burnett	Mr. Hanson Blatz, <i>Scientific Secretary</i>

S T A F F , D I V I S I O N O F B I O L O G Y A N D M E D I C I N E

Dr. Charles L. Dunham, <i>Director</i>	Dr. Gordon Dunning
Dr. Charles W. Shilling, <i>Deputy Director</i>	Dr. Paul B. Pearson
Mr. Howard C. Brown, Jr.	Mr. Robert L. Corsbie
Dr. Willis R. Boss	Dr. Paul S. Henshaw
Dr. Sterling Emerson	Mr. Herbert A. Stanwood, Jr.
Dr. John R. Totter	Mr. Richard W. Johnston
Dr. Roy E. Albert	Mr. Herbert W. Talkin
Dr. Thomas Ely	Mr. George T. Anton
Dr. John F. Bonner	Dr. Harry D. Bruner
Dr. Clifford V. Harding	Mr. Edward V. McGarry
Mr. James F. Haggerty	Mr. Ward Miller, Jr.
Dr. Walter Claus	Mrs. Frances Montgomery, <i>Secretary</i>

O T H E R , A E C

Chairman Lewis L. Strauss *	Mr. John Uhrlaub, <i>O & P</i>
Assistant General Manager A. Tammaro *	Mr. Frank Smallwood, <i>GM</i>
Assistant General Manager Paul F. Foster *	Mr. John P. Trevithick, <i>IA *</i>
Mr. Merrill Eisenbud, <i>NYOO *</i>	Mr. Duncan C. Clark, <i>IS</i>
Dr. Allen J. Vander Weyden, <i>IA *</i>	

* *present for part of meeting*

The meeting was turned over to Dr. Dunham for the DBM program presentation.

Dr. Charles L. Dunham

DR. DUNHAM announced that Dr. Edwin B. Fred, President of the University of Wisconsin, had accepted appointment to the ACBM but could not be present for this meeting because of a conflict. A number of additions to the Division were also announced as follows:

NEW DBM
APPOINTMENTS

Colonel Bernard F. Trum, Veterinarian, formerly of the Army Veterinary Corps. (Dr. Trum was not present because of his attendance at the sheep trials in Nevada); Dr. Allen Seymour, marine biologist who is replacing Dr. Robert Boss; Dr. Robert Reitemier, formerly of the Department of Agriculture; Mr. George T. Anton, formerly of the Chemical Corps; Dr. David Bruner, professor of physiology at Emory University to replace Dr. Roy Albert who has resigned as head of the Medical Branch; Miss Betty Wickhold, technical writer from O&P. DR. DUNHAM also announced the appointment of Mr. Hanson Blatz of the New York, HASL as Scientific Secretary to the Committee.

A brief review of the major current activities was made by DR. DUNHAM, including the following.

CURRENT
EVENTS

1. Transportation and storage of atomic weapons. (Joint study with AFSWF)
2. Preparation for a symposium on short-term fallout hazards. (Jointly with AFSWF)
3. Summary and correlation of the present state of contamination of the Island of Rongelap. (In answer to a question of Dr. Bugher's, DR. DUNHAM informed the meeting that the natives would not return to the Island until the study was completed.) The report was then being printed and expected to be released by the tenth of October, 1956.
4. Preparation for the October 16 briefing of the Commission by the HASL, DOD, and the DBM on Operation Redwing fallout studies.
5. Preparation of contributions to the revision of the Handbook, "Effects of Atomic Weapons" to be renamed, "Effects of Nuclear Weapons". Publication of this is expected on or about January 21, 1957.
6. Preparation of contributions to the next semi-annual report to Congress which will include Commission activities related to radiation health and safety. In part this report is to be a continuation of the eighth semi-annual report of 1950.

CURRENT
PROJECTS
(continued)

7. Preparation of a joint report by Dr. Failla and Merrill Eisenbud of the present status of the Sunshine study. This report will be circulated to Committee members for endorsement prior to submission to the Commission.

8. The Oughterson Report of the "Joint Commission to Investigate the Effects of the Atomic Bombs in Japan" which was published in July as part of the NNES. Comments which have been received on this report were favorable

NATO
MEETING

DR. DUNHAM reported on his address before the NATO Council on the substance and significance of the NAS report. At the same time Dr. Mayneord inform^{ally} reviewed the Medical Research Council Report. There seemed to be no serious disagreements although the objectives of the British and American reports were directed slightly differently. DR. DUNHAM reported that questions raised after the two reviews indicated a preoccupation with waste disposal, particularly by the Germans, French, and Dutch.

BUDGET

A brief review of the DBM budget indicated that it was very tight for 1957 because of unexpected demands on facilities which has also been experienced by other AEC divisions. The 1958 budget, however, looks better. Particular mention was made of the new education program which has been allotted approximately \$3 million for next year.

SECOND GENEVA
CONFERENCE

A second International Conference on the Peaceful Uses of Atomic Energy is definitely planned for the Summer of 1958 in Geneva although details have not yet been decided upon.

Brief mention was made of the status of the ABCC Program but the major discussion was deferred until the Executive Session.

Dr. Charles W. Shilling

DBM RESEARCH
PROGRAM
EVALUATION

DR. SHILLING'S presentation was divided into two sections. One on the research evaluation and contract procedures and the second on the plans for establishing programmatic categories both of which had resulted from inquiries and suggestions made by the ACBM at previous meetings. The principal points covered by DR. SHILLING are given in Appendix A. He explained the major changes being made to previous methods of evaluating research contracts.

1. Contracts valued at \$10,000 and under, of which there are very many, are being presented to the regular research meetings in a different manner. After review of such proposals by all branches, the contracts are presented to the Research Committee only if questions have been raised or if the Branch having jurisdiction requests it. Contract renewals in this class are reviewed by the Committee only at the third, sixth, and ninth renewal, unless specifically requested. In presenting contract proposals before the Committee, more attention will be paid to its overall integration in the entire program. Advisors or referees assisting in the evaluation may be invited to attend.

DR. BURNETT and DR. GLASS raised questions about the use of categories and about advisory and referee groups. It was stated that there are plans to set up definite committees of referees for each major category. These will consist of two or three consultants which will visit major contractors together with DBM representatives and assist in evaluating each separate program. In response to questions by DR. BUGHER and DR. BURNETT, it was explained that such groups would be purely advisory and decisions would be made by the ACBM staff. DR. SHILLING concluded by giving a breakdown of the number of current research contracts as follows:

204 of \$10,000 and under
197 of \$10,000 to \$25,000
37 of \$25,000 to \$50,000
24 of \$50,000 and over.

DR. GLASS raised a question about the contract with Dr. Neel of the University of Michigan which was recently approved for renewal for a very brief period after which another application was received for a fourteen-month period at a considerably higher degree of support. This was explained by DR. SHILLING and DR. EMERSON as being a technicality because of the fact the type of contract was changed to a cost reimbursement contract which had to be renewed on the first of October together with the fact that this department was moved into another building with plans for increasing the staff considerably. It was pointed out that Michigan now has a department of human genetics in the medical school, the first one in the United States. DR. SHILLING indicated that the formalization of the advisory group

DBM RESEARCH
PROGRAM
EVALUATION
(continued)

plan, together with establishment of categories, would facilitate supplying the ACBM with the information in a more orderly manner with a better sense of relative importance of the various projects in the programs.

PROGRAMMATIC
CATEGORY PLAN

DR. SHILLING then described the new plan for establishing programmatic categories within the ACBM program. The general plan and categorical listing is shown in Appendix B. He stated that the plan represented considerable effort covering many months under the leadership of Dr. Paul Henshaw. It was explained that the category titles in many instances were not always the best choices from a scientific point of view, but were believed to be of use in presenting the program to Congress, the Bureau of the Budget, or other groups consisting substantially of laymen.

It is planned to have one DBM representative for each particular category for the purpose of reviewing programs, visiting contractors, and attending scientific meetings in order for him to have a complete picture of the entire scope of the subject. It was explained that although this plan had been applied to date only to offsite research in order to be aware of the entire program at any time. DR. BUGHER raised a question as to the meaning of Category 15 entitled, "Basic Research". This question stimulated considerable discussion of the meaning of basic research, which depends greatly upon the user, most research scientists believing that they are doing basic research.

DR. SHILLING explained that the principal purpose of the "Basic Research" category was for projects that could not be placed in any one of the other categories. DR. GLASS raised the question as to the appropriate category for such things as Biochemistry which, although not listed itself, often could be listed under various other categories shown. DR. BUGHER again raised the matter of "Basic Research" category and warned of the problems which might arise because of the use of the term which depends so much on the point of view of the individual. After considerable discussion of the semantics of the problem, it was agreed that the term "Basic Research" would make Item 15 a vulnerable item for budgetary as well as other reasons and it was generally agreed that the category designation should be changed to "Non-Categorized".

DR. SHILLING pointed out the fact that the term "Atoms for Peace" currently has been used only for foreign programs although, in fact, the entire DBM research program is an "Atoms for Peace" program.

Dr. Paul Henshaw

SCIENTIFIC
CATEGORY
CLASSIFICATION

DR. HENSHAW was introduced to discuss the development of scientific category classification system which he has been working on for some time. It has been agreed that the research within the DBM program should be classified and recorded in a manner that would make the information readily available. After much study, it was decided to employ McBee Keysort cards at least as a beginning and then if the volume of material and its use warranted, the system could then be transferred to punch cards to be used in an IBM Machine. A sample of the card to be used is included as Appendix C.

It is estimated that there are between five hundred and one-thousand projects in operation within the national laboratories in addition to between a thousand and fifteen hundred in research contracts.

DR. HENSHAW reviewed similar card systems used at Brookhaven (in the field of the Effects of Radiation on Plants) and by Dr. Hollander in Oak Ridge. He also told of the effort of the Bureau of Standards to simplify patent searches employing a similar method. DR. BUGHER pointed out that the keysort type of card is very helpful and practicable for comparatively small operations, but for large programs, even the IBM type of card can become inadequate because of the high scanning speeds required. He pointed out the high rate at which scientific literature is being increased. DR. GLASS told of his experience in editing SCIENCE. In this case it was found advantageous to obtain identifying key terms, phrases, and ideas from the authors for the purpose of classifying the report for indexing. He suggested that it might be useful to require the contractors and their advisors to classify their own work rather than depending upon the DBM staff to do it. DR. HENSHAW proposed supplying contractors with a catalogue of activities for the purpose of assisting the contractors in classifying their own programs.

References were made to the library service to be initiated by the Ford Foundation in Washington and also the Biological Chemical Information Services also in Washington with which this program might be eventually integrated.

DR. SHILLING and his staff were congratulated on their efforts and on the great amount of work which had been done within the last four months to solve a number of problems raised at the last ACBM meeting.

(The meeting was adjourned for a brief recess.)

Admiral Paul F. Foster

ATOMS FOR
PEACE

The meeting was reconvened at 3:30 p.m. with the introduction of Admiral Paul F. Foster and some of his staff to present a review of the recent developments in the Atoms for Peace program. ADMIRAL FOSTER described the recent expansion in the Office of International Affairs which has been made into a Division. There are now thirty-two agreements of cooperation with other friendly countries in the field of atomic research and seven agreements in the field of nuclear power. In addition, there are eight research agreements and four power agreements under discussion or negotiation. The President made a recent offer (Penn. State U. Speech - June, 1955) to contribute one half of the cost of research reactors (up to \$350,000) under this program and so far, the United States has made commitments with four countries; Brazil, Spain, The Netherlands, and Denmark. ADMIRAL FOSTER also described several recent missions of the DIA to foreign countries and some of its future plans.

Dr. Milton Eisenhower recently announced a program of assistance to the University of Puerto Rico. A grant of \$350,000 is to be made to provide a very small training research reactor together with some laboratory equipment for the School of Medicine, the Agricultural Medical Station, and the School of Science. It is hoped that Congress will authorize an expansion of this program to provide several million dollars to establish a regional research and training center at Puerto Rico where it will be readily available to Central and South American Countries. A 20,000 kilowatt nuclear power plant is also planned for the university area subject to Congressional approval.

Plans are also being made for accelerating and facilitating the distribution of radioisotopes to foreign countries and a symposium is planned for Central and South American scientific leaders to be held at BNL next Spring.

John P. Trevithick

BILATERAL
AGREEMENT
PROGRAM

Admiral Foster introduced MR. JOHN P. TREVITHICK who discussed the bilateral agreement program. A recent change in scope relates to a provision by which research agreements may involve the transfer by the AEC of limited amounts of special nuclear material material, highly enriched U-233, U-235, and Plutonium. During the last year nuclear power agreements have been made with Australia, Switzerland, The Netherlands, and to a certain extent France. The French agreement is a compromise between a research and a power agreement and limits the

BILATERAL
AGREEMENT
PROGRAM
(continued)

amount of fuel to be provided to 40 kilograms, whereas the other three agreements allow fuel up to 500 kilograms of U-235 for the ten-year life of the the agreement. These are, therefore, for power demonstration programs rather than for the support of power reactors.

- A significant new provision in the Australian, Swiss, and Dutch agreements permits up to 6 kilograms of the 500 to be enriched up to 90 percent for use in the materials testing reactor. In the case of the Belgian agreement, it has been agreed to allow them 8 kilograms (apparently for political reasons in order to demonstrate the preferred position of Belgium).

All agreements require reprocessing of spent fuel elements in the United States or in facilities designated by the United States. Recent developments in Europe have been the negotiations among six coal and steel community regions; Belgium, Luxemburg, The Netherlands, France, Italy, and Germany.

DR. BUGHER asked if subcritical assemblies could be made available under the existing program. DR. VANDER WEYDEN answered that they could under existing policies. Another question by DR. BUGHER was the manner in which a foreign university could initiate a request for a reactor. MR. TREVITHICK explained that the university should make its proposal to the Atomic Energy organization existing in its own country, if one in fact did exist. If not, arrangements should be made through diplomatic channels since the AEC would accept such a request only from a foreign government but not from the university itself. DR. GLASS asked the criterion for defining a foreign government as a friendly one. MR. TREVITHICK stated that, in general, any country not within the "Iron Curtain" could be considered friendly. DR. GLASS also asked if there were any comparable agreements between the USSR and any other country or satellite to which MR. TREVITHICK answered that the USSR had bilateral agreements with some of its satellites; including, Czechoslovakia, East Germany, and Yugoslavia. MR. VANDER WEYDEN pointed out that in all the peaceful uses of the atom, the Biology and Medicine programs have been among the first advances and still are the means by which opportunity and promise can be offered. This view was endorsed and emphasized by DR. WARREN. Admiral Foster and his staff were thanked by DR. WARREN for the informative presentation.

Dr. Charles W. Shilling

FOREIGN
EDUCATIONAL
PROGRAM

DR. SHILLING stated that a \$5 million item for research equipment and support has been provided in the budget which should aid materially in assisting cooperative countries in establishing their own research training programs. Such funds could be used for small accelerators, mass spectrometers, radioactive laboratories, gamma sources, subcritical assemblies, low-cost computing devices, and so forth.

An illustration of the type of activity planned by the DBM for 1958 is the expenditure of \$310,000 to assist five countries in the establishment of isotope training facilities and a half-million dollars for the establishment of facilities for training personnel for the five foreign countries in the principals of radiological safety.

Two additional items of interest were the training of foreign nationals (\$2 million) and a scientific and technical conferences (\$200,000).

Another budget item of interest is the provision of \$350,000 for a contract with the engineering group in Puerto Rico for a reactor with a view of setting up sort of a Puerto Rican BNL for \$3.9 million including laboratory buildings for agricultural, medical, biological, and physical sciences. The extended use of Cobalt-60 teletherapy as well as other radioisotopes would be of great help to many South American countries because of difficulties in maintaining x-ray equipment in good operation.

Dr. Paul B. Pearson

TRIPS TO COSTA
RICA, ITALY,
AND SPAIN

On extremely short notice Dr. Pearson visited Costa Rica with Dr. Sterling Hendricks, Department of Agriculture; Dr. Harold H. Smith, Brookhaven National Laboratory; and Mr. Allen Newton, Division of International Affairs. He gave a detailed account of his visit and observations and again pointed out the importance of its location in Costa Rica. One reason for selecting Costa Rica is that it already has an established and functioning Inter-American Institute of Agricultural Sciences. DR. DUNHAM remarked that Dr. Pearson's complete report of the trip is now considered as a model for such a visit by the Division of International Affairs.

DR. PEARSON then reported briefly on his visit to Italy and Spain. DR. PEARSON expressed concurrence in the recommendation that an

TRIPS TO COSTA
RICA, ITALY,
AND SPAIN
(continued)

isotopes laboratory be made available to the Naples Zoological Station. In connection with the visit to Spain, it was found that some excellent laboratories exist there and they have sent four young scientists to the U. S. A. for training.

Dr. Sterling E. Emerson

The First International Congress on Human Genetics held in Copenhagen was attended by one-hundred registrants mostly from Western Europe.

INTERNATIONAL
HUMAN GENETICS
CONGRESS

DR. EMERSON was not too favorably impressed with the quality of the work, although a great deal of it was reported upon. The prospects of doing good human genetics work are not too favorable. After the meeting Dr. Emerson went to the Fifth International Congress on Radiobiology. This meeting was also found somewhat disappointing in that much of the material appeared to be obsolete.

While in Europe he attended a study group of the WHO on the effects of radiation upon human genetics. The reason for this meeting was to supplement the report of the scientific committee of the United Nations which did not include any geneticists.

A report of some of the details of the three meetings was made with some discussion by members of the ACBM.

DR. BUGHER reported that he had understood that Dr. Gopal-Ayengar of India had reported a 30 roentgen gonadal dose in a thirty-year period because of the monazite sands present. In response, DR. EMERSON said that upon questioning, Dr. Gopal-Ayengar was somewhat more modest and quoted a figure of 10 to 20 roentgens in thirty years. (This is about ten times the normal background at sea level.) This report initiated a general discussion of the levels of cosmic radiation at various locations and altitudes.

Mr. Richard W. Johnson

MR. JOHNSON reported on the Fourth Instruments and Measurements Conference being held in Stockholm. Since the meeting was being conducted at the same time as the ACBM meeting and was represented for the AEC by Mr. Butenhoff; a complete report could not be given. Mr. Johnson gave background material and told about the AEC exhibit which consists primarily of a mockup exhibit of verification of neutrinos at the Savannah River

FOURTH INSTRU-
MENTS CONGRESS

project. The detector consisted of a sandwich made up of a liquid phosphur and ordinary water. 330 five-inch photomultiplier tubes were employed.

MR. JOHNSON read excerpts from a letter of Mr. Butenhoff's in which he told of the progress of the meeting.

Dr. Charles Shilling

DR. SHILLING presented the domestic aspects of the training program to be conducted by the DBM that require funds of \$5,111,000 during fiscal year 1958. Essentially, the program consists of several parts.

DOMESTIC
TRAINING
PROGRAM

1. The radiological physics program is to be increased by the addition of twenty-five fellows and the stipend is to be raised to \$2,500.
2. A new program of advanced training in radiological physics at the PhD level is planned in order to provide personnel for some of the administrative jobs within the AEC program. This is planned for five or more candidates and will cost approximately \$50,000.
3. The industrial hygiene and industrial medical program is the same as previously.
4. Special training courses at AEC laboratories, given principally in the Summer, are planned on the same scale as previously. This is a \$308,000 item.
5. Plans have been made to provide isotopes training laboratories for medical schools. A conference was held with four representatives of medical schools in order to work out some of the details which have yet to be decided upon.
6. It is planned to provide isotope training laboratories for biology departments in universities and agricultural schools. This presents a problem in that there are so many more such biology departments than there are medical schools and a decision will be required as to what level this support should be. A conference is planned to discuss some of the details of this problem similar to the conference held for the medical school program. This item was originally for \$1.5 million but was reduced by the budget cut to about \$500,000.
7. It is planned to continue the program of radiobiological training for high school science teachers. During the past year

DOMESTIC
TRAINING
PROGRAM
(continued)

such programs were conducted at Harvard, Duke, and New Mexico with varying results. The Harvard program seems to have been conducted in a very satisfactory manner and the program was reported to have been most effective. At Duke University the program appeared to be fairly good; but at New Mexico, the program results were less satisfactory. All of the last group of students were selected from the state of New Mexico in contrast from the other programs which drew from much larger sections. In addition, the New Mexico students appeared to have had poor backgrounds which may be an indication of the educational level in that section of the country. The establishment of a more elementary course in New Mexico has been considered for next year.

A considerable discussion followed as to the relative merits of adjusting the level of the course to meet the needs of the locality, but no conclusions were reached.

8. A small budget item has been provided for the establishment of a radiobiology lecture series through the National Science Foundation and the American Institute of Biological Sciences. A series of three to five-day lectures are to be provided at universities where such service are not normally available. Lecturers will be furnished from within the AEC program and their transportation and per diem paid during the lecture period. It is expected that lecturers will travel only short distances from their normal headquarters.
9. A small allowance has been made for establishing isotopes laboratories in some of the schools of public health.

A request was made for funds for biology and medical training reactors, but this program was transferred to the Division of Reactor Development. DBM may request a specific biology or medical training reactor program from Reactor Development whenever appropriate. At this point there was some discussion as to the mechanism by which these reactors would be built and to determine in what way they would integrate into the DBM educational program.

In response to a question by DR. BUGHER as to the power levels of such reactors, DR. DUNHAM explained that a reactor of a few watts is planned. The Argonne National Laboratory had been asked to design such a reactor. It will cost approximately \$100,000 including the building. Its flux is about 10^{-9} to 10^{-10} at the surface of the fuel elements and may be used for activation analyses, the production of short-lived isotopes, as a neutron source, for certain small animals and micro-biology studies and also for general education in health and safety problems. DR. BUGHER remarked that the figure of \$100,000 appears to be quite high. A general discussion followed concerning small reactors recently advertised in scientific journals.

DOMESTIC
TRAINING
PROGRAM
(continued)

During the description of the training program DR. BURNETT had remarked several times that there were several important decisions to be made as to its implementation. The principal question is just how is the money to be spent. He expressed the opinion that perhaps the Commission is taking a far too restrictive attitude on the use of the educational money by limiting its use to equipment. Whereas, it was his opinion that much of it should be used to support personnel. DR. DUNHAM expressed the opinion that the General Manager's office was concerned about the establishment of grants which would be perpetuated indefinitely. An example was given of the NIH cancer grants offered to medical schools which have resulted in annual \$25,000 allotments to every medical school.

The meeting was recessed at 5:40 p.m. to be resumed at 9:00 a.m. the following day.

(OVERNIGHT RECESS)

The meeting was reconvened at 9:00 a.m. on Saturday, September 22 with Dr. Shields Warren presiding.

Dr. Charles L. Dunham

DR. DUNHAM announced that there would be a small tripartite meeting prior to the United Nations Committee meeting on October 22. Its purpose is to exchange information on methods of analyses and methods of sampling and collecting fallout. Representatives from DBM together with four or five representatives of England and a couple from Canada are expected to participate.

DR. DUNHAM then asked Dr. Paul Pearson to discuss the strengthening of the University of Tennessee farm program.

Dr. Paul Pearson

UT-AEC
PROGRAM

At the May, 1955 ACBM meeting in Oak Ridge, it was recommended that a committee be appointed to study the University of Tennessee-AEC program. Plans were discussed with Dr. Waters, President of the University and his staff who expressed accord with the proposal. As a result, a committee was appointed consisting of Dr. E. C. Stakman, Dr. Jenson and Dr. Harry Kornberg. It is expected that they will pay their first visit to Oak Ridge during the next month or six weeks. They have been asked to investigate all aspects of the program including the competency of the contractor and the personnel. It is believed that the University shares the belief that the ~~problem~~ should be strengthened.

gram

At this point DR. WARREN proposed that a continuation of the previous day's discussion of the training activities be conducted.

Dr. Charles W. Shilling

MEDICAL SCHOOL
TRAINING PROGRAM

Dr. Shilling was asked to report on studies made by an informal committee which had met two days previously. The committee included, in addition to Dr. Shilling, Dr. David Bruner, Dr. Burnett, Dr. A. K. Solomon of Harvard, and Dr. John Cooper of Northwestern. Dr. Solomon has been responsible for the isotopes training program at the Harvard Medical School which has become a regularly given elective course and Dr. Cobper was one of the first to set up an isotope laboratory where training is given for both students and undergraduate students on an elective basis. This ad hoc committee arrived at a number of general conclusions as follows:

1. The public law as amended allows the AEC to give "grants and contributions to the cost of construction and operation". This was interpreted as giving the AEC a specific charter not to make contracts, but to give gifts for construction and operation of facilities.

After an extended discussion by the Committee of the interpretation of this "charter" as it is applied to medical schools, hospitals and teaching hospitals, it was decided that a grant could be used for the cost of construction and operation of reactors and other facilities and equipment in order to meet the need for medical doctors trained in the use of isotopes in research and in treatment.

2. It was further agreed that support should be made available upon application by any medical school designated as Class "A" by the AMA. This incidently would include support both for Hawaii and Puerto Rico, but would probably eliminate Canada.

The second conclusion of the ad hoc committee resulted in considerable discussion of the advisability of using AMA designation as a criterion. DR. BURNETT indicated that osteopathic schools would be ruled out in this manner. DR. DUNHAM indicated that the experience of the Public Health Service in their grant program showed that any such wording would subject the Commission to considerable pressure and recommended that the wording merely refer to classification as a medical school. He also told of experience in isotope distribution whereby the AMA designation was challenged and an exception was made. Since a public announcement will be necessary, the wording should be such that an unfavorable response would not result from various pressure groups.

It was the general conclusion of the committee that reference to the AMA be deleted.

3. The ad hoc committee decided that the available funds were to be utilized in any manner that would best achieve the stated purpose of initiating or improving education in the medical aspects

MEDICAL SCHOOL
TRAINING PROGRAM
(continued)

of radiation. It was believed, however, that certain limitations should be placed on the institution or individuals involved. The medical school should have an isotopes license and the man responsible for the training should be requested to present a description of the proposed program including the course to be given, the number and type of students and whether it is to be a graduate or undergraduate course. They should also provide a list of facilities and equipment needed and also facilities existing at the time of application.

4. It was decided that not over \$30,000 would be given for the first year and not over \$12,500 for subsequent years with a limit of five years for any institution. Each university would be limited to one five-year program for each of its medical schools. This would limit large medical schools with several university hospitals to a single program. It was also decided that such a program may be included in the bio-chemistry program of a medical school, if desired by the institution.

DR. SHILLING pointed out that the same problem would have to be worked out for the distribution of funds for the biology programs in universities by Dr. Pearson. This undoubtedly would be a more difficult problem because of the greater number of colleges in the country. (Approximately 652 according to Dr. Warren)

DR. BURNETT pointed out that there might be some schools needing small items of equipment to supplement existing programs. It was felt that this should be limited to \$2,500 as an outright gift.

The matter of paying faculty members was discussed and it was believed that this was inevitable and in the case of NIH grants, has been quite successful. Personnel in this case are usually paid at a low level without tenure. The university should be permitted to allow this for technical help rather than ~~provisional~~ *Professional* help if desirable.

DR. GLASS warned of a possible danger if the medical portion of the plan is inaugurated before the biological part because of intramural competition within the universities. It should be decided whether a grant to a medical school of a university excludes the possibility of a grant to the biology division. DR. BURNETT expressed the opinion that it was the general feeling of the ad hoc committee that a prior gift should not prejudice any future gifts to the other department. It was believed, however, that the two phases should not be initiated as one program. Since there was considerably greater similarity with the medical phases and medical grants, these could be used as guides for the subsequent biological program. DR. SHILLING said that discussions with the Reactor Development Division resulted in the conclusion that other details should be worked out before any announcement is to be made. He also said that it had been decided that consideration be given to

MEDICAL SCHOOL
TRAINING PROGRAM
(continued)

agricultural schools and public health schools. This would permit large universities to be allowed four isotope laboratories under one program; one for the agricultural school, one for the public health school, one for the medical school, and one for the biology department all of which are some-

times separated by great distances. DR. PEARSON expressed the opinion that the program should not be thought of on a departmental basis because the fundamental training should be essentially the same. Some problems would be eliminated if the university were to set up a program that cuts across departmental lines. DR. BUGHER expressed agreement with this opinion but pointed out practical difficulties in such a plan. It was DR. BURNETT'S opinion that a school should be able to work out its own method of using a grant. DR. WARREN also expressed agreement with this but said that a single department would necessarily conduct the program because of the manner in which universities are organized. Dr. Dunham raised the question of a possible problem in that a grant of equipment for training might easily be diverted to research activities.

DR. BURNETT made mention of another recommendation in that although written reports would not be required, meetings of the program directors at appropriate intervals would be desirable to discuss the progress of the general program and to allow for an interchange of ideas. DR. SHILLING added that overhead would not be permitted.

At this point the Chairman suggested a discussion of the training of secondary school teachers through a program for teachers colleges.

HIGH SCHOOL
TEACHER TRAINING

The suggestion was introduced by DR. WARREN with some comments about the distributions of high school teachers in New England, one third of whom comes from a single school of education in that area where an isotopes training program should prove to be most effective.

DR. BUGHER suggested that such a program should extend into the elementary school grades and thought should be given to the training of elementary school teachers. There has been considerable talk about the lagging of the United States in the training of engineers and scientists and its need to maintain our standard by stimulation and orientation in the early years. DR. BUGHER pointed out that because of budget cycle lags, some consideration should be given to the future direction of the educational program along these lines.

HIGH SCHOOL
TEACHER TRAINING
(continued)

DR. GLASS remarked that even among those who had taken the college level isotope training, some of the students appeared to have insufficient intellectual curiosity about radiobiology and indicated that some early training might arouse interest. He suggested that the program might better be reorganized on two different levels. The first Summer's work devoted to the fundamentals including the use of the kit of laboratory equipment and in high school level experiments and a second Summer devoted to the principals of radiobiology. DR. GLASS expressed the opinion that the program be supplemented to increase the opportunities of introducing new students into the program. Serious consideration should be given to the awarding of scholarships purely on the basis of students ability as in the scholarships and the fellowships offered by the National Sciences Foundation and the National Institute of Health. It is often difficult, however, to evaluate the interest or ability of high school students or even college undergraduates since they have received little guidance in this respect.

Dr. Shields Warren

DR. WARREN pointed out that in the consideration of any scholarship program, the problem of security clearance always arises.

SECURITY
CLEARANCE
REQUIREMENTS

There is still in existence a rider on the appropriations bill which requires security clearance for those participating in the AEC fellowship program. A lengthy discussion followed as to the problem of restrictions imposed by the security rider on the appropriations bill and whether or not an outright grant given to an institution which in turn was used in part to provide scholarships was subject to the security rider. The relationship between such allotments and salaries given to research students participating in AEC contracts was discussed. There is also the problem of supplying funds which are mixed with other funds some of which are provided by other organizations to provide fellowships. It appeared clear that in a literal interpretation, the fellowship rider would not be applicable, but on the other hand, it was pointed out by MR. BROWN that it would not be wise to ignore the intent of the Legislature on the matter.

DR. SHILLING in response to a question by DR. DUNHAM indicated that he did not expect to receive specific recommendations from the Committee at this time but interpreted their comments as indicating general approval of the program. It was suggested, therefore, that a motion be worded to express the opinion of the Committee on the education program, particularly with respect to any restriction in

ACBM RESOLUTION
REGARDING
TRAINING PROGRAM

the use of available funds. This motion was prepared (later) by DR. BURNETT and reads as follows:

After full discussion of the proposed program for training in radiobiology and the biological and medical uses of radioisotopes to be supported by the AEC, the Advisory Committee on Biology and Medicine strongly recommends that the Division of Biology and Medicine be permitted the widest possible flexibility in initiating and supporting this program. It is the firm conviction of the Advisory Committee that this program in all of its broad aspects, will be most effective if recipient institutions are restricted to the least possible degree in utilization of funds derived from grants designed primarily for training.

The motion was passed unanimously by the Committee.

ADMINISTRATIVE
APPROACH IN
MAKING GRANTS

DR. BUGHER spoke briefly on what he termed the administrative approach to the problem of assistance to the peaceful atomic developments to other countries. He gave an example of negotiations by another agency in the Near East for certain hospital supplies and facilities. During the course of lengthy negotiations, a Soviet representative appeared and after brief negotiations agreed to supply the country with a number of items, and they were actually delivered the following week because he had a shipload of standard equipment with him. DR. BUGHER said that although a large government agency is just not designed to do small things rapidly, the Commission could learn a lesson from this method. It would have been helpful if the task force that visited Puerto Rico could have authorized some equipment for immediate delivery. It would be a very useful form of propaganda to authorize negotiating representatives to make prompt deliveries of certain equipment upon concluding an agreement. DR. WARREN pointed out that there has been much criticism of the isotopes program because of the amount of red tape and forms as compared to the much simpler method of obtaining British isotopes. He indicated that this viewpoint should be brought to Admiral Foster's attention. DR. SHILLING expressed the viewpoint that this is also important in connection with the domestic program in order that the equipment could be delivered quickly to the university.

Dr. Dunham next introduced Mr. Eisenbud who spoke about the Red Wing operation.

Mr. Merrill Eisenbud

OPERATION
REDWING

MR. EISENBUD described many of the details of the operation which are classified but indicated that the results of some of the measurements will explain a number of anomalies noticed in the fallout distribution. He also indicated that the program has been highly successful due mostly to the top staff of JTF-7 who were very devoted and gave complete support to the program. They appeared to understand the purpose of the fallout studies which had not been the experience with previous military staffs.

Dr. Willis R. Boss

Marine aspects of project Red Wing were discussed by DR. BOSS. This part of the program consisted of five marine surveys before, during and after the tests.

PACIFIC MARINE
SURVEY PROGRAM

1. The first was a resurvey of Rongelap and also Bikini and Eniwetok. Samples were taken of water plankton and fish and also land flora and fauna.
2. This survey was the first open-sea survey within the restricted area which took place after the fifth shot. (Between June 11 and June 21, 1956.)
3. This survey was conducted by the George Vanderbilt Foundation of Stanford University consisting of collections made at Saipan, Leyte, Yap, Guam, and the Palaus in May, June, and August. Others are planned for the future until February 1957. Water is collected and the activity of plankton is measured.
4. This is the second open-sea survey which has just been completed. This survey proceeded westward going in a zig-zag direction as far as Guam and returned to Eniwetok in the same zig-zag fashion. There is one disturbing factor in that the activity has gone so far southward near the equatorial counter current and there is no survey in that area to find out where it is. If it goes East it will reach one of the great tuna fishing grounds for the Japanese.

At this point MR. EISENBUD described the plans for collecting water samples with the cooperation of the Navy. Foot lockers containing polyethylene bottles and kits for obtaining samples have been placed on every ship. If samples are required, the ships can be radioed and they could collect samples while underway at fifty-mile intervals. It will take these samples some time to be read,

PACIFIC MARINE
SURVEY PROGRAM
(continued)

but it costs the AEC nothing and it covers a wide area because of the number of ships involved. There is also another sampling program which brings in approximately several pounds of tuna fish a month for Strontium analysis. The levels found are somewhat lower than the milk levels, but are probably less significant.

DR. BUGHER pointed out that the figure 7,000 quoted for plankton (phase 4) cannot be compared directly with the figures of about 1,000 found for Troll samples. This could probably be explained by the fact that the Troll survey was conducted a year after the test which may explain the difference because of the time factor. MR. EISENBUD commented that the iodine content might also have been a factor. DR. DUNNING was then introduced in order to describe the criteria of safety for offsite populations at the Navy test site.

Dr. Gordon M. Dunning

(Much of DR. DUNNING'S discussion involved weapons testing and is therefore classified.)

NEVADA OFFSITE
EXPOSURE CRITERIA

He pointed out that the NAS has recommended exposure limits of 10 r up to the age of thirty for the general population and 50 r for up to the age of thirty for the individual. He also said that in the case of populations close to the test site, we are dealing neither with individuals or with the general population and, therefore, the limits should probably be somewhere between the 10 r and 50 r scale. A tentative figure is proposed as 10 r for a ten-year period which he admitted was somewhat arbitrary. The figure of 3.9 r in any one year which has been used previously should be continued because it has a considerable background and has been accepted by the population near the test site as a recognized limit. DR. DUNNING explained that an effort should be made to use these numbers as an operational guide rather than absolute limit, a matter which may present a public relations problem since the general population does not appreciate that slight differences near the exposure limit are immaterial. He told of a number of specific experiences during recent tests in the exposure of certain areas.

DR. GLASS commented on the proposal because he felt that geneticists would be the most likely groups to comment on any such proposal. He didn't believe that any geneticists would be concerned about the exposure of any minute fraction of the total population to a level

NEVADA OFFSITE
EXPOSURE CRITERIA
(continued)

permissible for occupationally exposed persons if these persons were warned that by living there, they would be getting exposures equivalent to occupational levels. This remark resulted in considerable discussion of the philosophy and psychology of setting different limits for different elements of the general public. MR. BROWN raised the question as to whether or not the Commission would be required to condemn and purchase any land if it were necessary to expose occupants to levels above the recognized population limits without any choice on their part, since it might constitute a deprivation of property without due process. Since this subject was closely related to a matter being considered by Dr. Claus, he was introduced in order to present his report.

Dr. Walter D. Claus

IDAHO OFFSITE
EXPOSURE CRITERIA

In connection with the reactor testing station, problems similar to that resulting from weapons testing would arise in the future and it had been proposed that certain sections of the adjacent property be purchased in order to exclude residents. DR. CLAUS presented a strong argument to interpret the exposure of the general population as an average population rather than an absolute limit for any individual and also to consider the limit for any individual to be the same as that for the occupational worker. He plans to suggest this to the NCRP before their recommendations are presented. He further explained that if an attempt is made to keep every member of the general population within the 5 r per year limit, the average will be somewhere between 1 and 3. He emphasizes that under the modifications he proposes, no one would be harmed and there would be no need to compromise with our consciences. He expressed the opinion that it would be best to keep this out of the NCRP regulations. DR. BUGHER reported that there had been no discussion in the NCRP of immediate offsite populations but that the thirteen-week provision gives a certain amount of leeway. DR. CLAUS pointed out that in Dr. Failla's recently proposed changes for Handbook 59, the concept of 10 percent would apply to people in the vicinity. If this were deleted from the NCRP recommendations, the AEC would not be obliged to use it. It was pointed out by MR. BLATZ that the 10 percent figure already appears in Handbook 59 and also in the proposed Part 20 of the AEC regulations but accidental and incidental exposures beyond this limit are acknowledged in that they must be reported to the Commission. DR. DUNHAM indicated that the new Handbook would be very carefully worded so that any exposure over the stated limit would not be interpreted as constituting an injury. The matter as to whether the 10 percent figure does or does not apply to immediate populations was not resolved but it was agreed that its interpretation constitutes a serious problem.

Mr. Merrill Eisenbud

ADMINISTRATION
OF MAXIMUM
LIMITS

MR. EISENBUD expressed concern with the manner in which the concept of the maximum permissible dose has been applied in the past.

Although there has been considerable experience with similar maximum permissible limits of other types such as the floor loading of a building, such experience has evidently not been available to those preparing radiation codes. In the case of floor loading, the values specified are frequently exceeded as in the case of a heavy safe. Building inspectors, however, are authorized to use judgment and to permit reasonable deviation. He also spoke of experience in the uranium processing plants where workers at times were consistently being overexposed although their exposure for a period of years was well below the average maximum permissible concentration. MR. EISENBUD expressed a belief that the whole future of the program was in jeopardy because of the unrealistic way maximum permissible dose figures are being applied and that an occasional overexposure should not be considered a failure on the part of the control program.

DR. GLASS expressed agreement with the point of view, but mentioned that even for an individual the belief is that there is a level beyond which possible genetic damage to his own immediate offspring would result, although at a very much higher level than the figures under consideration. The British Committee set this limit for the individual as a total of 200 roentgens over a forty-year period.

DR. WARREN expressed the opinion that if any land at all were purchased because of the high radiation level, the Commission would be subject to later damage claims from anyone in a similar situation where land had not been purchased because of its cost.

MR. TAMMARO explained that cost had not been a consideration in the case of the Idaho property but the criterion had been whether or not the land had been irrigated. The purchase of irrigated land had seemed to present a public relations problem. Actually no decision has yet been made. DR. WARREN suggested purchasing the land and allowing the residents to use it on an annual license.

There was further discussion on the subject of whether the 5 roentgen limit was intended to apply on a population basis or an individual basis. The various recommendations appear to mean on an individual basis although not clear.

Mr. Corsbie was introduced by Dr. Warren to discuss the Civil Defense Program.

Mr. Robert L. Corsbie

1957 CIVIL
DEFENSE TESTS

The proposed Civil Defense tests for 1957 includes about forty scientific projects. These have been proposed in addition to the FCDA and the AEC, by the Departments of Defense, Health Education and Welfare, Commerce and Agriculture; the General Service Administration, the State Civil Defense Administrations, U. S. Industry, NATO member nations, France, West Germany, and Sweden (a non-NATO nation).

(At this point Mr. Corsbie's description of the proposed tests became classified and are immaterial to these Minutes.)

Several projects involve radiation dosimetry for human exposures, some to develop information on ecological aspects of fallout, countermeasures, and decontamination aspects and procedures and others to improve fallout predictions as related to meteorology. The development and testing of shelters of various construction is also planned.

Plans have been made for preliminary aerial surveys between October 15 and November 1, 1956 for the purpose of determining the present levels as well as to familiarize the crew with the terrain and give experience to FCDA personnel.

MR. CORSBIE told of the vigorous attempt to declassify civil defense documents.

CIVIL DEFENSE -
AEC INSTALLATIONS

MR. CORSBIE then introduced the subject of the civil defense aspects of AEC installations. He described a general review being made by his group consisting of a questionnaire to operations managers and visits to the larger installations. Six of the ten Operations Offices have already been visited as well as Los Alamos and Berkeley. After the remaining four large installations are visited, an attempt will be made to prepare an interim report by November 1. MR. CORSBIE then described briefly Operation Alert 1956 where AEC installations responded to a wide variety of degrees. Particular mention was made of the excellent analysis made by Berkeley. The results showed that 50 percent of the personnel would have been fatalities solely from fallout.

Chairman Lewis L. Strauss

At this point Dr. Warren had introduced Chairman Lewis L. Strauss who had dropped on to visit the meeting. CHAIRMAN STRAUSS spoke briefly on the Agency for International Cooperation being organized at that time in New York.

In answer to a question by [unclear] form [unclear] [unclear]

DR. GLASS announced that there had been a major breakthrough in biochemistry and in the past year artificial binucleotides had been successfully synthesized. This was probably the greatest step forward in biochemistry that has happened in a long, long time. Several different types of material had been synthesized and it is of importance that one of them, the deoxyribose, is the chemical basis of heredity. DR. GLASS said in response to a question by CHAIRMAN STRAUSS that it had been announced but had not been "played up" in the newspapers. CHAIRMAN STRAUSS suggested that William Lawrence of the "New York Times" write the "lead article" although it was agreed that it was not the sort of subject that could be dealt with easily in the public press.

DR. BUGHER mentioned another important piece of work in which various molecules had been pulled apart into their fundamental components.

CHAIRMAN STRAUSS expressed a particular interest in the Division of Biology and Medicine program. He stated that it and the Research Division program required attention since the other major claimant on public funds, the Division of Military Applications, found it "easier going". His interest and effectiveness was commended by Dr. Warren. CHAIRMAN STRAUSS inquired as to the general method by which radioactive isotope tracers had been used in these new developments and the use of C-14 and P-32 for this was explained briefly by DR. GLASS.

Dr. Claus was then introduced to present his plans for the maintenance of exposure data.

Dr. Walter D. Claus

PERSONNEL
EXPOSURE
RECORDS

DR. CLAUS had previously distributed a proposed Chapter for the AEC Operations Manual covering this subject. Dr. Forrest Western and Mr. Raymond Zintz had collaborated in its preparation. In general, the method of reporting by AEC contractors were divided between those contracts of \$200,000 a year and greater and those less than this figure. It is believed advantageous to have immediate reports on single radiation incidents which might either involve serious personnel injury or property damage or present a public relations problem. In addition to these, there is the need for a regular summary report of a statistical nature for the purpose of acquiring experience and learning the general exposure levels being maintained within the Commission program. The reporting program is intended to comply with the various recommendations of the NCRP and of the NAS.

MEDICAL X-RAY
EXPOSURE
RECORDS

In commenting on this program, DR. DUNHAM mentioned the difficulties of including diagnostic x-ray exposures to the occupational x-ray exposure. He asked if the Committee would try to suggest a practical approach to this matter of recording diagnostic x-ray exposures. The matter had been discussed with former Surgeon General, Dr. Scheele, soon after the NAS report was released and Dr. Scheele expressed a feeling of futility with respect to this particular problem.

The NCRP had discussed the problem and a suggestion was made that a study be initiated on the feasibility of such recordkeeping, although most of the Committee members said that it was not practical or feasible with the population of the size of the United States. The Socialized Medical Program in England would make such a program more practical. The British Medical Research Council, however, did not recommend that recordkeeping extend beyond occupationally exposed individuals. The question of radiation recordkeeping for the entire population has been raised by the Chairman, the Appropriations Committee and the Joint Committee. DR. DUNHAM suggested the possibility of a study and mentioned the particular experience that the Navy had had with Dog Tags carrying such simple information as blood types and also in the Army with vaccination records. DR. GLASS said that the NAS Committee had given this question some consideration and appreciated the great difficulties and the psychological obstacles. He expressed the importance of a gradual education program for the general population as to the importance of radiation exposure which is becoming more

MEDICAL X-RAY
EXPOSURE RECORDS
(continued)

and more universal. He recalled that two suggestions had been made; one, the initiation of a study on a relatively small population in order to determine the difficulties and effectiveness and two, the possible use of the social security card as a means of keeping a radiation exposure record. CHAIRMAN

STRAUSS commented on the loss of a child's accumulative record because social security cards are carried only by adults. He also suggested the advisability of suggesting the program as a privilege rather than as an obligation because of the normal American resistance to anything obligatory. He suggested the possible use of a durable plastic card upon which entries could be made with a stylus.

DR. DUNHAM said that the employees at the Oak Ridge National Laboratory are now attempting to accumulate information on non-occupational exposure primarily to diagnostic x-rays. He suggested that this might serve as a pilot study. DR. BURNETT mentioned the possible resistance on the part of physicians. CHAIRMAN STRAUSS suggested the possibility of a campaign for State laws to require medical practitioners to keep proper records as a condition for a license to use x-ray equipment. In this connection DR. DUNHAM mentioned the proposed program of the New York State Radiological Study and called upon MR. BLATZ to describe the plans of the New York Society. These are for the voluntary issue of record cards to patients by radiologists. Radiologists and hospitals will be furnished cards (similar to the WHO immunization cards for international travelers) and also a table of typical gonadal doses for various standard diagnostic x-ray techniques. DR. EMERSON said that the subject had come up at the World Health Organization meeting but the participants were of the opinion that it was merely wishful thinking. Some of the difficulties in recording exposure data in the Hiroshima and Nagasaki cases were described by DR. WARREN. DR. CANTRIL suggested that the Richland area in Washington might be the ideal location for a pilot study because of the fact that there was only one x-ray machine in Richland and very few of the Richland residents went elsewhere for their medical examinations.

DR. BURNETT expressed the opinion that any suggestion such as that made by Chairman Strauss, that State laws be enacted, would arouse the AMA and physicians to the point of at least thinking about the problem. The result might be an effort towards self regulation. DR. CANTRIL raised some questions about the difficulties which would be encountered because of the fact that most x-rays are taken by non-radiologists who have little conception of proper techniques. CHAIRMAN STRAUSS raised questions about the difficulty of evaluating exposure in connection with fluoroscopic examinations. DR. WARREN and DR. CANTRIL reassured him that reasonably accurate dosage approximations could be made in spite of a variation in techniques. DR. CANTRIL expressed encouragement in the recent interest by pediatricians in this problem.

The meeting was adjourned until 1:00 p.m. for lunch.

EXECUTIVE SESSION

The meeting was reconvened in executive session with the members of the Committee, Dr. Dunham and Mr. Blatz present.

The Minutes of the previous meeting were read and approved.

It was agreed that because of the interference of the usual meeting and with Dr. Fred's Board of Regents meetings, future meetings would be held on the third Saturday of the month and the preceding day; in November (16 and 17), January (18 and 19), March (15 and 16), and May (17 and 18). It was voted that the November 16 and 17 meeting be held at Brookhaven in order that Dr. Failla be able to attend and the January meeting was tentatively set for Berkeley, California.

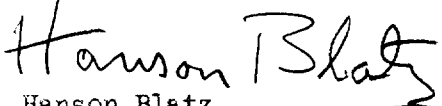
A general discussion was held on the limitations of weapons testing and also considerations were given to the subject of administration of the Atomic Bomb Casualty Commission program. Several suggestions were made for possible future directors and their qualifications were discussed. The subject of change in name for the Project was discussed but DR. HOLMES had expressed some reluctance to make any such move at the present time. It was generally agreed that no action or recommendation with regard to the ABCC should be made at the present time by the Committee.

Some consideration was given to the selection of a new member for the ACBM and the fact that a clearance now takes from three to six months makes an early selection necessary. It was agreed that the next member should not be a physician since there were already several present on the Committee. DR. DUNHAM suggested that the inclusion of a physicist might serve to balance the Committee. The termination of Dr. Doisy's service suggests the need for another non-medical biochemist.

DR. DUNHAM discussed plans for the possible expansion of the DBM staff in the future and the need for an industrial physician.

The Executive Session was adjourned at approximately 3:00 p.m..

Respectfully submitted,


Hanson Blatz
Scientific Secretary, ACBM