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MONTHLY STATUS AND PROGRESS REPORTS FOR OCTOBER 1951

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IV - BIOLOGY AND MEDICINE

Research Projects Approved during October

The following number of proposals were approved by the Research Committee for negotiation or renewal during the month:

	<u>No. of projects</u>	<u>Amount</u>
Medicine	12	\$145,296
Biology	14	131,432
Total	26	\$276,728

Advisory Committee for Biology and Medicine

The ACBM held their 29th meeting at the Las Vegas Test Site on October 29 and 30, 1951. The Committee recommended that the present program in cancer research be vigorously pursued and continued, pointing out that cancer is the specific industrial hazard of atomic energy. They also recommended that there be continued exploration of the Commission's special facilities and of fissionable materials for possible further application to cancer research, diagnosis, and therapy.

Atomic Bomb Casualty Commission

Dr. A. E. Brandt, Biometrician of the NYOO, is en route to Tokyo, Japan, where for a period of 6 months he will review the statistical procedures used by ABCC and the results of the examinations of Japanese exposed to the Nagasaki and Hiroshima bombs.

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Fellowships

Members of the Divisions of Biology and Medicine and Research met with representatives of the National Science Foundation to discuss fellowship programs and overhead allowance on university and college supported research. Since the NSF expects to have about 1.4 million dollars for support of fellowships during the academic year 1952-53, it is expected that the AEC will not continue its fellowship program except in the specialized fields of industrial medicine and in health physics. The overhead rate for research supported at colleges and universities being adopted by the NSF is substantially higher than the present AEC level for lump-sum contracts.

Regional Education for Southern Universities

A representative from the Division attended the Conference on Regional Education for the Southern Universities held at Daytona Beach, Florida, October 21-23. This was attended by the Governor of Tennessee and presidents, deans, and other representatives of more than 50 Southern institutions. This conference meets annually to consider ways of cooperation and specialization and so that the peculiar advantages of particular institutions may be utilized widely and without duplication. Thus, a strong department in English literature or physical chemistry in one institution may accept students from other institutions for a brief period, and one course in the use of radioactive isotopes may serve the whole area. The Board of Control had arranged a panel discussion on Monday evening, October 21, on "Problems and Procedures in Developing Proposals for Contract Research." Speakers at this meeting included representatives of AEC, ONR, National Institute of Health, U. S. Army, and USAF. The interests of each group were described and specific methods for applying for contracts were indicated. There was excellent cooperation between the speakers in outlining the special interests of the various government agencies, and it should result in more intelligent planning of proposals submitted from Southern universities.

Biology Branch

Soil analysis. At the Feasibility meetings for Operation WANGLE in August, 1951, there was pointed out the importance of soil analysis of the proposed crater area for particle size and chemical composition. The AEC project at the Department of Agriculture Beltsville Soil Laboratory took soil samples in September at ground zero area for the shots. Samples were taken at about one-foot levels from the surface to a depth of about 22 feet. Complete analysis of the soil has shown some differences in the soil at the underground and surface sites which will be considered in planning the program. Since the test site is the bottom of old lake beds, there is about ten times the normal amount of calcium, sodium, and potassium found in arable soils. Thus, the neutron capture by these elements and the induced radioactivity will be higher than expected in other soils. Such analyses are necessary for proper evaluation of these experiments for future health safety planning.

The AEC project at the University of California at Los Angeles Medical School has made a background survey of the whole Las Vegas test area. These measurements of natural occurring radioactivity in soil, plants, and animals will be available for comparison of the level of lingering radioactivity in the area after present or future operations.

Medical Branch

Biomedical Program Directors' Meeting, Las Vegas, Nevada. The fall meeting of the Biomedical Program Directors was held on Wednesday, October 31, in Las Vegas, Nevada. Dr. Shields Warren presided. The program revolved around a discussion of the biological effects of neutrons and the available methods for measuring neutrons in terms of biological efficiency. These discussions were headed up by Dr. Gioachini Failla of the Advisory Committee for Biology and Medicine and Dr. Austin Brues, Director of the Biology and Medicine program of the Argonne National Laboratory. In addition, there were brief discussions by Dr. Stafford Warren of the University of California, Los Angeles, on civil defense planning in the California area with special reference to radiological defense and defense in general against atomic weapons.

Dr. Hardin Jones of the University of California Radiation Laboratory at Berkeley brought the group up-to-date on the large molecule lipoprotein studies both in relation to arteriosclerosis and other disease states as well as in relation to whole body radiation injury.

Dr. Robert J. Hasterlik gave a brief resume of the studies to date on the patients the Argonne group are studying who received radium "therapeutically" some 20 years ago.

Dr. Charles Dunham gave a brief resume of the preliminary data available on the biomedical test program at Operation GREENHOUSE. The group were fortunate in being able to witness CHARLIE AND DOG SHOTS of the recent series of tests in Nevada.

Industrial physicians meeting. The fall meeting of the industrial physicians was held at the Argonne National Laboratory on October 17-18. Among the subjects discussed the first day were: surgical treatment of hand injuries, microfilming medical records, detection of radioactive substances in wounds and methods of handling, a guide for medical services for construction contractors, and recent developments in methods of artificial respiration. The second day was devoted to a tour of the West Area facilities.

Biophysics Branch

Sir John Cockroft, Director, Atomic Energy Research Establishment, Harwell, England. Members of the staff met with Sir John Cockroft, Director of the Atomic Energy Research Establishment, Harwell, and Mr. A. K. Longair, of the United Kingdom Scientific Mission, to discuss advances in radiation biology during the past year. Permissible levels of

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radiation exposure under emergency conditions were given particular attention. It was tentatively agreed that a third United States-United Kingdom conference be held in the United States during 1952, to consider evidence to date which bears on maximum permissible concentrations of radioactive materials in air and water. Previous conferences of this nature were held at Chalk River, Canada, and at Harwell, England, and have a strong bearing on AEC operating levels.

Permissible radiation dose levels. A policy was formulated and a statement issued regarding permissible radiation dose levels for personnel participating in BUSTER-JANGLE tests. A permissible exposure of 3.9 roentgens of gamma radiation has been authorized, without regard to the rate at which the dose is accumulated, provided this exposure represents the total integrated dose over any period of 13 consecutive weeks (one quarter) which includes the test period. A similar exposure policy has been suggested for maintenance personnel who would be called upon occasionally to service marine reactors. These authorizations retain the international permissible level of 0.3 roentgens per week, averaged over a long enough period to permit efficient operation, yet limiting short-time exposures to doses which are not hazardous. They are not, however, considered to be applicable on a regularly recurring basis, as for example, to plant personnel who are exposed daily.

Maximum permissible levels in shipping radioactive materials. A problem receiving current attention is that of maximum permissible levels of surface contamination in shipping, in laboratory operations and in rehabilitation of contaminated property. As a partial basis for determining permissible shipping contaminations, a questionnaire has been circulated through administrative channels to AEC contractors who handle radioactive materials, asking for information on their present practices and standards, and for a statement of the lowest levels which they can meet at reasonable cost. It is hoped that realistic recommendations can be formulated, with general AEC concurrence, for changes in the presently undefined regulations governing shipping of radioactive materials. Official representation on the National Research Council's Subcommittee on Shipping of Radioactive Materials is expected.

Civil Defense Liaison Branch

Test activities. The Chief, Civil Defense Liaison Branch, participated in the recent series of tests of the Nevada Test Site as Project Officer, Program 9.1b (AEC personnel shelter) and as monitor of Program 9.1a (FCDA backyard-type shelters), tested during Operation BUSTER. Other representatives of the Branch were present also during the operation. The AEC Disaster Planning Coordinator, as well as representatives of the FCDA (as described in previous report), also were present to observe the operation under the sponsorship of the radiological safety group.

Representatives of the Branch conferred with the Effects Test Group on details of Operation JANGLE and studied the structures to be tested. Particular notice was paid to underground tunnels, prefabricated

concrete structures and the several designs of heavy, medium, and light steel frame structures as well as those of reinforced concrete designed to give specific data on behavior underground shock and seismic disturbance anticipated from the underground detonation of an atomic bomb.

Valuable observations were made of the radiological safety operation under actual field conditions.

Radiation instrument and source loan program. During the month, arrangements were made for the loan of instruments and sources for civil defense training purposes as follows:

Instruments:

New Jersey State Civil Defense Agency
Georgia State Civil Defense Agency
Rock Island, Illinois

Sources:

Georgia State Civil Defense Agency
Tennessee State Civil Defense Agency
Rock Island, Illinois

Design criteria activities. Inquiry was continued during October into the effectiveness of shielding where gamma rays enter the shielding material at an angle. There appears to be a lack of experimental evidence on the matter, but the consensus is that the unmodified slant dimensions may be used.

The plans of the storage facilities at Rocky Flats were examined and approved.

Several portions of the pamphlet, "Design Criteria," which the Division of Construction and Supply is preparing as a guide for architect-engineers on AEC projects, were received during the month, and certain changes suggested.

The Branch participated in a meeting to review the report of Harris and Associates on the Savannah River Operations called by the Divisions of Production and Construction and Supply.

Radiation Instruments Branch

Scintillation counter symposium. Plans are being formulated for a symposium which is to be held at the National Bureau of Standards and will be jointly sponsored by the Institute of Radio Engineers, American Institute of Electrical Engineers, the Bureau of Standards, and the U. S. Atomic Energy Commission. It is planned to invite a number of persons from the atomic energy projects and from industrial firms in Canada and the United Kingdom which manufacture photomultiplier tubes.

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