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M. W. Boyer, General Manager

November 13, 1952

John C. Bugher, Director, Division of Biology and Medicine

MONTHLY STATUS AND PROGRESS REPORT, OCTOBER 1952 -
DIVISION OF BIOLOGY AND MEDICINE

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Transmitted herewith is the Monthly Status and Progress Report for this
Division covering the month of October 1952.

Enclosure:
Report

CC: J. H. Burchard

O'NEILL:emr

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SURNAME ▶	O'Neill <i>on</i>	Brown <i>BB</i>	Dr. Bugher		
DATE ▶	11/13/52	<i>11/14</i>			

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MONTHLY STATUS AND PROGRESS REPORT

Division of Biology and Medicine

MONTH OF OCTOBER, 1952
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Weapons Test Activities

Civil Effects Program--Operation UPSHOT. ([REDACTED])

A request has been received from the Federal Civil Defense Administration for the inclusion of additional experimental programs in Operation UPSHOT (1953 spring tests). The September monthly report discusses civil effects projects already approved, namely: AEC Personnel Shelters; Biomedical Experiments; Teleranging Tests; Neutron and Dosimetry Studies, etc. The additional tests proposed by the FCDA consist of:

FCDA Effects Studies - home shelters and typical residences, air-zero locators, and irradiation studies of foods and drugs (in collaboration with the Food and Drug Administration, FSA). FCDA has requested that these tests be carried out in conjunction with an "open shot" at which civil defense and news media representatives would be present on an unclassified basis.

FCDA Radiological Defense Training - evaluation of Radeif Survey methods, instruments, and radiological hazards.

Civilian Vehicle Tests (FCDA in collaboration with AEC) - evaluation of vehicles as shelters; physical and mechanical evaluation of vehicles exposed to atomic attack.

The new proposals discussed above will be reviewed in the near future by the Biomedical and Structures Test Planning and Screening Committees and, if approved, will be forwarded to the Test Director for a determination of feasibility.

[REDACTED]
[REDACTED]

Civil Defense Activities

Meeting on Air-Raid Shelters. (UNCLASSIFIED) Members of the Division met with representatives of the firm of Consulting Engineers engaged by the New York State Department of Public Works and with the State Civil Defense Engineer on October 31.

Discussions concerned the bomb shelter survey proposed by New York State for the cities of Buffalo, Rochester, Albany, Troy, Schenectady, Utica, Binghamton, Syracuse, and Niagara Falls. A review was made of available data relative to the value of ordinary building materials, the most efficient structural forms to resist blast overloadings, and the importance of shielding against thermal and radiation hazards. The U.S. Strategic Bomb Survey data on effects of the atomic bomb in Japan and the "Effects of Atomic Weapons Handbook" were recommended as the most reliable compilations of useable material for use in the survey.

It was recommended that liaison be established with the FCDA since established criteria for shelter accommodations based on building and population densities and methods for determining shelter needs are being studied by that agency. Arrangements were made to meet with FCDA on November 30.

The project as proposed by New York State will consider shelter accommodations for approximately 3 million persons, with 2 million of the total residing in New York City. The cost of the shelters has been estimated to be about \$100 per person, or a total expenditure close to \$300,000,000. The State will pay for the cost of the present study, but the actual construction of shelters would be on a matching fund basis.

Research Activities

Uptake of Fission Products in Animals and Plants. (UNCLASSIFIED) A study is being conducted by the University of Washington to evaluate the uptake of fission products by aquatic and land animals and plants in connection with current test operations. The project will be a continuation of the study of biological contamination in the Eniwetok and Bikini areas. Resurveys will be made of these areas prior to the current test series. Information will be obtained on the distribution of fission products in waters of the test area; their accumulation by fish, clams, corals, and microscopic plants and animals; and the presence of radioactive materials in bottom deposits. Land plants will be studied for the presence of tumors and other abnormalities observed as a result of earlier bomb tests.

Use of Firefly in Radiation and Chemical Analysis. (UNCLASSIFIED)
Experiments by the Oak Ridge National Laboratory group show that the intensity of the light produced by the firefly can be used to measure extremely minute quantities of ATP (adenosinetriphosphate) and other organic compounds and enzymes of importance in living cells. This new method is being used to follow the formation and destruction of ATP in bacterial, plant, and animal cells under various conditions including x-radiation. The assays are based upon the finding that the intensity of light produced by an extract of the luminescent organ of the firefly in a test tube will depend upon the amount of ATP which is present. ATP is of particular importance in supplying energy for the functioning of cells and tissues.

Malformations Induced by Irradiation. (UNCLASSIFIED) Investigators at New England Deaconess Hospital studying acute and chronic radiation in animals have reported some important findings in developmental malformations produced by radiation.

Single doses of radiation (about 150 roentgens or higher) were given to pregnant rats on successive days during gestation to observe effects on the developing offspring. No deformities occurred during the first eight days of gestation. However, very striking degrees of malformation in the brain occurred between the 9th and 19th days, each day showing some characteristic malformations. Skeletal and eye deformities also occurred during the 9- to 14-day period.

Use of Flavonoid Compounds in Radiation Studies. (UNCLASSIFIED)
Experiments under the AEC-UCLA project demonstrate conclusively that the flavonoids (rutin, hesperidin methyl chalcone, hesperidin and naringin) are ineffective as protective agents in roentgen-ray irradiated guinea pigs. These animals are one of the few species which seem to require flavonoid compounds as an essential metabolite in their ascorbic acid metabolism. They also have a high irradiation sensitivity.

Following medication with flavonoids (except hesperidin), there was an increase in the rate of mortality in the post-irradiated group. Similar results were found in pre-irradiated groups medicated with hesperidin and naringin. The increased rate of mortality in the post-irradiated guinea pigs indicates that the flavonoids may have acted synergistically with the irradiation and decreased the resistance of the animals to the noxious effect of the radiation.

Industrial Health Program

Health Physics

Mohawk Valley Advisory Committee-KAPL. (UNCLASSIFIED) Personnel from the health and sanitation departments of the State of New York and the City of Schenectady were given a one-day briefing at KAPL (October 29) on the standards and practices of KAPL in safeguarding environmental health and safety. This group had been constituted as an advisory committee to KAPL on environmental problems of mutual interest and included the following from the State of New York: the Commissioner of Health, Deputy Commissioner, Director of Environmental Sanitation, Executive Secretary of the State Pollution Control Board, and the City Manager of Schenectady who is also Sanitary Engineering Consultant to KAPL. The initial meeting of this group was attended by members from the Division of Biology and Medicine, the Division of Reactor Development, the General Electric Company, and the Schenectady Operations Office.

A tour of the laboratory and the STR sites provided the group with detailed background of the physical facilities and the safety measures employed throughout the laboratories.

Classified Health Physics Conference. (UNCLASSIFIED)

Approximately 175 health physicists and representatives from AEC installations, universities, and Public Health departments met in Idaho Falls on October 16, 17, and 18, under the auspices of the Idaho Operations Office and the Division of Biology and Medicine to confer on mutual problems in radiological health protection.

Progress of the National Committee on Radiation Protection in detailing maximum permissible levels of exposure was described, and questions of application of these levels to plant practices, waste disposal, and fall-out from nuclear detonations were given consideration. Panel discussions were held on economic aspects of radiological protection and on shipping regulations, with a view toward exploring means of decreasing costs and expediting shipments of radioactive materials. One session dealt with specialized dosimetry problems. Attendees also visited the National Reactor Testing Station, including the central health physics facilities and other installations.

Industrial Medicine

Industrial Physicians Meeting. (UNCLASSIFIED) AEC and contractor Industrial Physicians met at Richland (HANFORD WORKS), Washington on

October 15, 1952. Discussions were held on the current status of problems associated with the medical programs of the various departments. Absenteeism and Control, Skin Decontamination, and related topics were reviewed.

Radiation Instruments

AEC Instruments Conference. [REDACTED] An instruments conference sponsored jointly by the Radiation Instruments Branch and Brookhaven National Laboratory is scheduled for December 3, 4, and 5 at Brookhaven. Approximately 35 of the leading instrument personnel from the AEC plants and laboratories have been invited, and informal round-table discussions are planned.

Radiological Radio-Telemetering System. [REDACTED] The development of a radiological telemetering system using a radio-frequency link for transmission of data has been arranged under Division sponsorship with the National Bureau of Standards. The scheduling calls for completion of a prototype system in time for testing and evaluation at the next Nevada test series. It is proposed that three gamma-detecting data stations will be placed in an area 10-30 miles downwind of the target for measuring fall-out radiation. The receiving station, depending on radio-transmission factors, will be located as near as possible to the Control Point with a relay station between it and the three data stations.

General

Bio-medical Program Directors Meeting. [REDACTED] The Bio-medical Program Directors met at Richland (HANFORD WORKS), Washington on October 13-14, 1952.

~~Abstracts from~~ Papers on research and present findings in the field of radiation toxicity and effects were presented. Subjects covered were Tritium studies, Analysis of Low Level Plutonium, Calcium Versenate for treatment of Heavy Metal Poisoning, Waste Disposal Studies, Pile Effluent Activities, I-131 Contamination in Plant Environs, and Radioiodine Toxicity.

The inspection of plant facilities within the restricted reservation included the new Biophysics Laboratory and the new Aquatic Biology Laboratory. The new Biophysics Laboratory is in the final stage of completion and will be ready for occupancy by the end of the year. The new Aquatic Biology Laboratory occupies about 10,000 square feet near the biology building and has been in use since September of this year.