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K. D. Nichols, General Manager

November 17, 1953

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

MONTHLY STATUS AND PROGRESS REPORT, OCTOBER 1953
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 1953.

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Report

CC: J. H. Burchard

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MONTHLY STATUS AND PROGRESS REPORT
Division of Biology and Medicine
MONTH OF OCTOBER, 1953

Neutron Test Activities

Neutron Dosimetry Program-Operation CASTLE. ([redacted]) arrangements are being made to incorporate neutron measuring techniques developed by the Oak Ridge National Laboratory into the program of neutron radiation measurements being undertaken by the Travel Research Laboratory during Operation Castle. The program will be of benefit to both groups and will involve a minimum of expense and effort.

The Oak Ridge research group has made use of neptunium, uranium and plutonium fission detectors in studies to determine total neutron flux. Neutron measurements made during previous field tests have not covered the wide range of neutron energies of interest to the biophysicists. Such data derived from these fission detector measurements would be of considerable importance in interpreting the total neutron dose.

Research Activities

Cell Free Photosynthesis. (UNCLASSIFIED) Photosynthesis, the process by which the energy of the sun is converted to food stuff, has always been studied in the intact cell.

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red blood cell membrane are at a slower rate in sickle cells than in normal cells. The alkaline phosphatase in sickle cell anemia plasma is significantly higher than that in normal plasma. Initial studies on phosphate transfer using metabolic inhibitors indicate the absence of a certain enzyme from the sickle cell anemia blood. One of the most significant observations of this group on the problem is that one of the protein components of the plasma has a different mobility as determined by electrophoresis. This finding is being investigated further with additional electrophoresis equipment and under varying experimental conditions.

This work complements other investigations in which the globin part of hemoglobin in sickle cells is found to be different from that of normal cells.

Shielding Studies. (UNCLASSIFIED) The problem of providing adequate shielding for personnel protection in equipment designed for radiation sources must be coupled with that of economics in operation. For lower energy ranges, shielding is not an expensive factor. However in the use of higher intensity radiations, the problem of personnel protection involves high expenditures. This problem is being investigated under a cooperative project with the National Bureau of Standards to determine design factors of various types of equipment in which savings might be realized, and at the same time to determine with greater accuracy the

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- a. Study of the sensitivity, quality dependance, and maximum range of the film badge; and
- b. Cross-calibration study.

Some 15 different NRC installations participated, and the findings show that most of these installations are able to get a fair degree of precision in measuring and interpreting gamma and x-ray radiation doses over a wide range of energies and intensities. The survey has been important in pointing out areas where improvements may be initiated in order to reduce inaccuracies in film dosimeter measurements.

2. Testing of Radioactive Electric Cells. Tests were made of two Model B-50 electric cells of the radioactive source type manufactured by the Radiation Research Corporation of West Palm Beach, Florida. These are the first cells of this type which have appeared on the market. Preliminary results indicate that the load characteristics are better than those claimed by the manufacturer. However, the voltage of the cells when no load is applied showed some dependence on humidity conditions. It is expected that electric cells of the radioactive source type will find [wide] application in low current devices where long storage and small battery dimensions are required.

General (UNCLASSIFIED)

The Advisory Board on Water Decontamination met at Oak Ridge National Laboratory in October to review the current status of the Oak Ridge project on water decontamination. The Board was set up in 1950 to provide technical advise on the project which is under the nominal supervision of

the U. S. Public Health Service at Oak Ridge. Representatives were present from AEC, U. S. Public Health Service, Department of Defense (DSDP), New York State Waterworks Commission, and the American Waterworks Associations.

The meeting included discussions of the Interim Progress Report submitted by the Oak Ridge research group, and the following subjects were covered: research on the decontamination of radioactive waters, the problem of radioactivity in water courses, reconcentration of radioactivity by natural agents, water decontamination, and instrumentation. The subject report will be revised to include further studies and later issued as an official document for distribution by the Oak Ridge National Laboratory. It contains comprehensive data on decontamination studies and will be of considerable value to all waterworks engineers in the country, in addition to having wide application in AEC operations.

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