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**Office Memorandum • UNITED STATES GOVERNMENT**

TO : M. W. Boyer, General Manager

DATE: October 12, 1953

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

SUBJECT: MONTHLY STATUS AND PROGRESS REPORT, SEPTEMBER 1953 -  
DIVISION OF BIOLOGY AND MEDICINE

This document consists of 5 Pages  
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Transmitted herewith is the Monthly Status and Progress Report for this Division covering the month of September 1953.

Enclosure:  
Report

CC: J. H. Burchard

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MONTHLY STATUS AND PROGRESS REPORT

Division of Biology and Medicine

MONTH OF SEPTEMBER, 1953

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Research Activities

Biological Monitoring of Columbia River Salmon. (UNCLASSIFIED)

Biological monitoring is being continued at Hanford Works, Washington of the effects on aquatic organisms of reactor effluents discharged in the Columbia River. Data have been obtained on the dilution level of reactor effluents tolerated by salmon and on the effects of the effluents on growth and mortality by conducting experiments using various area effluents--mixtures of all industrial water discharged in the Columbia River from a Reactor Area. The effluents are all mildly radioactive, have high temperatures, and contain chromates and chlorine which are toxic to aquatic organisms. Strength of the effluent dilution with river water was determined by percentages from previous experience. The five per cent level was chosen for evaluation of any latent effects since only slight effects were observable at this level.

Silver salmon eggs and young were subjected to a series of dilutions of reactor effluent for eleven months. No adverse effects were observed at concentrations of 3.5 per cent or less, but slight effects occurred at the 5 per cent level. At a 10 per cent level appreciable mortality occurred throughout the test, and growth was poor during the last four months. Radiation received by the fish is estimated at not over 6 roentgens equivalent physical for the entire period, and adverse effects are attributed to unfavorable temperatures and chemical toxicity. Fish from a control lot and from the lot subjected to the 5 per cent concentration were marked before liberation to the ocean and will be studied for possible latent effects when they return as adult fish.

Uptake of Fission Products in Plants. (UNCLASSIFIED) In addition to data previously reported on the soil movements of radioactive strontium, yttrium, cesium, and iodine, and their biological effects on plants, studies have also been extended to determine the maximum uptake of these fission products. At Hanford the barley plant was used in determinations of the maximum uptake of strontium, yttrium, cesium, and iodine. Investigations indicate that barley can accumulate a concentration of strontium about 1.4 times that in the soil, and a concentration of iodine about 3.8 times that in the soil. Only slight amounts

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of yttrium and cesium are concentrated in the plants.

In addition, experiments have been completed on a fifth element-- ruthenium. The absorption of ruthenium from nutrient solution by Red Kidney Bean plants was studied as a function of the ruthenium concentration and of the acidity of the solution (pH). Observations show that the uptake of ruthenium is dependent upon, but not strictly proportional to, the concentration of ruthenium added to the nutrient culture, and the uptake efficiency increases as the acidity increases.

Industrial Health

Measurements of Radioactive Dust Particles. (UNCLASSIFIED) The University of California at Los Angeles Atomic Energy Project has developed an improved method for determination of particle size in airborne dust. The method has direct application to industrial hygiene problems involving such measurements and should facilitate their solution. Heretofore, the usual methods of sampling airborne dust have required analysis of particle size by time-consuming and tedious microscopic observations. The new technique involves collection on membrane filters which are then dissolved in an organic solvent. The resultant dust suspension is then analyzed turbidimetrically (in terms of light falling on a photocell after passing through the suspension). The concentration of the dust in the sample does not affect the results of the particle-size determination. The turbidimetric method gives good accuracy and reproductibility of results.

Radiation Instruments Program

Fourth Tripartite Conference on Instrumentation. (CONFIDENTIAL) Preliminary arrangements have been made between the United States, Canada, and the United Kingdom to hold a tripartite conference on instrumentation at Harwell, England, in May 1954. On October 15 at Chalk River, Ontario a meeting will be held by the planning committee of representatives from AEC, Chalk River, and Harwell to establish an agenda for the conference.

Items suggested in preliminary discussions for the spring conference are pile instrumentation, chemical plant instrumentation, transistors as applied to nuclear instruments, problems in radiation dosimetry, and new circuit techniques. Specific topics of a classified nature will be limited to previously established Commission-approved items on instrumentation within the general areas of Health and Safety (Area 2), Isotopes (Area 3), Extraction Chemistry (Area 7), and Low-Power Reactors (Area 9).

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Civil Defense Activities

Structures Test Planning and Screening Committee (CONFIDENTIAL)

The seventh meeting of this Committee was held on September 29, 1953 for the purpose of (1) reviewing the status of the test reports from the Civil Effects tests of operation UPSHOT/KNOTHOLE; (2) to discuss items previously proposed for testing but not included in the Spring 1953 series; and (3) to receive proposals from federal civil agencies for future tests. To assist Committee members in planning and preparing for future tests, the Division of Military Application presented the current schedule of continental and overseas tests. It was emphasized that a series in the continental limits in FY 1954 was extremely unlikely, but that possibly a series would be conducted in the Fall of 1954 or FY 1955.

The meeting indicated that all agencies participating in the Civil Effects Group of UPSHOT/KNOTHOLE felt valuable data had been obtained and that the tests were uniformly successful. Additional information is needed relative to probable behavior under aerial attack of a group of items dealing with water supply and piping, office buildings, hospitals, schools, and residences. The incidence and spread of fire, possible contamination of AEC plants through blast pressures on ventilating systems, and the probable necessity of developing data on doors to group shelters were also named as items needing additional study, possibly leading to field tests.

Dispersal of Federal Agencies at the Seat of Government.

At the request of the Office of Defense Mobilization, the Commission participated in discussions relative to the dispersal of federal agencies performing essential functions at the seat of government. Representatives also attended from the Federal Civil Defense Administration, Department of Defense, and the Central Intelligence Agency. The purpose of the meeting was to review established criteria relative to dispersal distances from the zero milestone in the District of Columbia to new sites for buildings which house federal office personnel, and distances between dispersed sites. This group reviewed the criteria adopted in 1952 and, in light of subsequent events, considered the adequacy of the criteria under present conditions.

Briefing of FCDA Personnel. (UNCLASSIFIED) The Commission held a classified briefing for the Deputy Administrator and six staff members of the Federal Civil Defense Administration on September 29. The presentation included information on the raw materials operation,

production program, weapons program, and reactor program. Each section was given by a representative of the respective divisions and followed the pattern of the briefing given to the Administrator of FCDA and his top staff in April.

Transmittal of Weapons Test Information. (UNCLASSIFIED) The cooperative arrangement between AEC and the Department of Defense (Armed Forces Special Weapons Project) under which information is transmitted to the Federal Civil Defense Administration on weapons effects data is continuing. Earlier in the year, the Joint Chiefs of Staff issued a directive under which AFSWP operates in providing classified weapons test information to FCDA. Subsequently, FCDA recommended that discussions be held between the three agencies to determine future policy in this area. Concurrence of this proposal was given in a letter from the Chairman of the Commission to the Department of Defense (AFSWP), and the Chief of the Civil Defense Liaison Branch was named as the Commission representative.

Instrument and Source Loans. (UNCLASSIFIED) During the month, the following loans were made:

Instruments - Delaware Civil Defense Organization

Cobalt 60 Source - New Hampshire Civil Defense Organization. This represents the first loan of a high intensity (5 curies) Cobalt 60 source to a State group for the purpose of calibrating their civil defense radiological detection instruments and is an extension of the cooperative AEC-FCDA program to assist State and local civil defense bodies in their training and operations.

General

Conference on Administration of Research. (UNCLASSIFIED) The Seventh Annual Conference on Administration of Research was held on August 31, September 1 and 2, at the University of California, Berkeley, California. These conferences which are not sponsored by any single organization, but are an outgrowth of mutual interests, include representatives from government, industry, and universities desirous to exchange views and information on their problems and experiences in the administration of research. The need for such meetings became apparent when a number of scientists involved in research assignments found that most of their time was spent in administering research. Research administration was recognized as

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a function apart from actual research and also presented difficult problems and obstacles to research progress. The conference meetings have aided materially in capitalizing upon the collective experience of others facing the same problems.

During the recent sessions, papers were presented from the various groups, and open discussions were held on the problems presented. Included were such items as: Sources of Support of Research, Overhead, Role of the Federal Government in Research, and Role of the Universities in Research.