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UNITED STATES ATOMIC ENERGY COMMISSION

QUARTERLY PROGRESS REPORT

July - September 1955

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Part VII

Biology and Medicine

RESEARCH ACTIVITIES (UNCLASSIFIED)

Carbon 14 Tracer Studies

The assimilation of carbon and the biosynthesis of rubber in rubber trees are being investigated at Argonne National Laboratory in cooperation with the U. S. Department of Agriculture and the Quartermaster Corps, U. S. Army. Most important findings are:

1. Radioactive carbon was found first in leaf rubber and only later in stem rubber. This finding conflicts with the earlier theory that rubber formation occurs only in the bark.
2. Radioactive carbon assimilated in rubber trees appears to be formed initially into high-molecular-weight rather than low-molecular-weight rubber.
3. Starved rubber plants may metabolize at least a fraction of the rubber formed.

The carbon 14-labeled rubber formed in these experiments will be used:

1. By the Quartermaster Corps to study the breakdown or degradation of rubber under various environmental conditions;
2. By the New South Wales University of Technology in an attempt to isolate and identify the inositols present in the rubber plant tissues. Inositols are sugar-like compounds which may, when labeled, provide useful information in plant and animal studies.

INTERNATIONAL CONFERENCES

Conference on the Soil-Plant-Animal Cycle

AEC representatives participated with United Kingdom and Canadian personnel in an unclassified conference at Harwell during July on the soil-plant-animal cycle of fission products from fallout. Particular attention was given to radioactive strontium as a fallout hazard in agricultural areas. Information exchanged will assist technical personnel in all three countries in studies of this problem.

Conference on Genetics

The status of research on genetics was discussed in an unclassified conference at Harwell in September. The exchange of ideas and the outlining of areas for future study will facilitate research on the possible genetic effects of atomic energy activities.

UNCLASSIFIED

BIOLOGY AND MEDICINE

CIVIL DEFENSE ACTIVITIES

Operation ARME

An aerial radiological monitoring exercise (Operation ARME) was conducted at the Nevada Test Site in October by AEC for personnel sponsored by the Federal Civil Defense Administration. Participants observed the use of aerial survey techniques and equipment developed by the AEC Health and Safety Laboratory to monitor large water and land areas adjacent to test sites. Residual radiation data collected by aerial monitoring were found to be generally consistent with data gathered by conventional surface monitoring techniques. The test demonstrated the technical feasibility of using aerial radiological survey techniques in civil defense against fallout from nuclear weapons.

Civil Defense Conference

A two-day classified conference on "Nuclear Effects and Civil Defense" was held in Chicago in October in response to a request by FCDA for further assistance in defining and evaluating weapons effects information. AEC and contractor personnel summarized the state of knowledge of the effects of atomic weapons to the extent that such information is applicable to civil defense research. The discussions covered the types of physical damage to civilian structures; biomedical effects including blast biology; the effects of prompt and residual radiation on foodstuffs; and the measurement and evaluation of radiological contamination. (End of UNCLASSIFIED section.)

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