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Progress Report to the Joint Committee on Atomic Energy

JUNE THROUGH NOVEMBER 1952 (U)

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BY memo DATE 12-29-93

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By authority of the U. S. Atomic Energy Commission

Per Don P. Burrows by [illegible] Date 1/3/53

~~Document No. LXXXI—172~~ Downgraded to secret RD AEC letter [illegible]

UNITED STATES ATOMIC ENERGY COMMISSION

WASHINGTON, D. C.

DECEMBER 29, 1952

1172/5331/20

~~TOP SECRET~~

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PART VI

BIOLOGY AND MEDICINE

([redacted]

During the past six months emphasis has been given in the biology and medicine program to preparations for weapons test operations. A world-wide monitoring network system was established during the recent IVY tests to collect data on radioactive fall-out resulting from detonations at Eniwetok Atoll. In the coming spring, 1953, continental series (UPSHOT-KNOTHOLE), the personnel shelters designed for Commission installations will be tested for resistance to blast and for shielding against neutron and gamma radiation. Test proposals submitted by other Federal agencies and now being reviewed by the Commission are discussed below under the Civil Effects Test Program. In addition, the Commission, through its National Laboratories and contracts with private research institutions, has continued to support a large number of biomedical research projects.

Weapon Test Activities

(Unclassified aspects of the monitoring activities and fall-out studies performed in connection with recent weapon tests will be discussed in greater detail in the Thirteenth Semiannual Report to be submitted to the Congress in January 1953.) (End of [redacted]section.)

Fall-Out Studies (TUMBLER-SNAPPER Series) ([redacted]

The extensive nation-wide monitoring system for collecting fall-out data during the spring, 1952, weapons tests at the Nevada Proving Ground, as described in the previous report, has made possible the collection, tabulation, and analysis of tens of thousands of fall-out measurements. None of these has indicated the presence of any concentration of radioactivity which could have been considered a health hazard. A final report on fall-out will soon be completed.

Radiation effects on the photographic industry. By prior agreement the Commission has transmitted relevant information on the effects of test activities to the National Association of Photographic Manufacturers to enable that group to take proper precautions against possible effects of fall-out upon photographic products. As a result of the TUMBLER-SNAPPER tests, the Eastman Kodak Company found it advisable to close its cellulose ester plant, at Kingsport, Tennessee, for several days. On the industry as a whole the effects of radioactive fall-out particles have been very much less than anticipated.

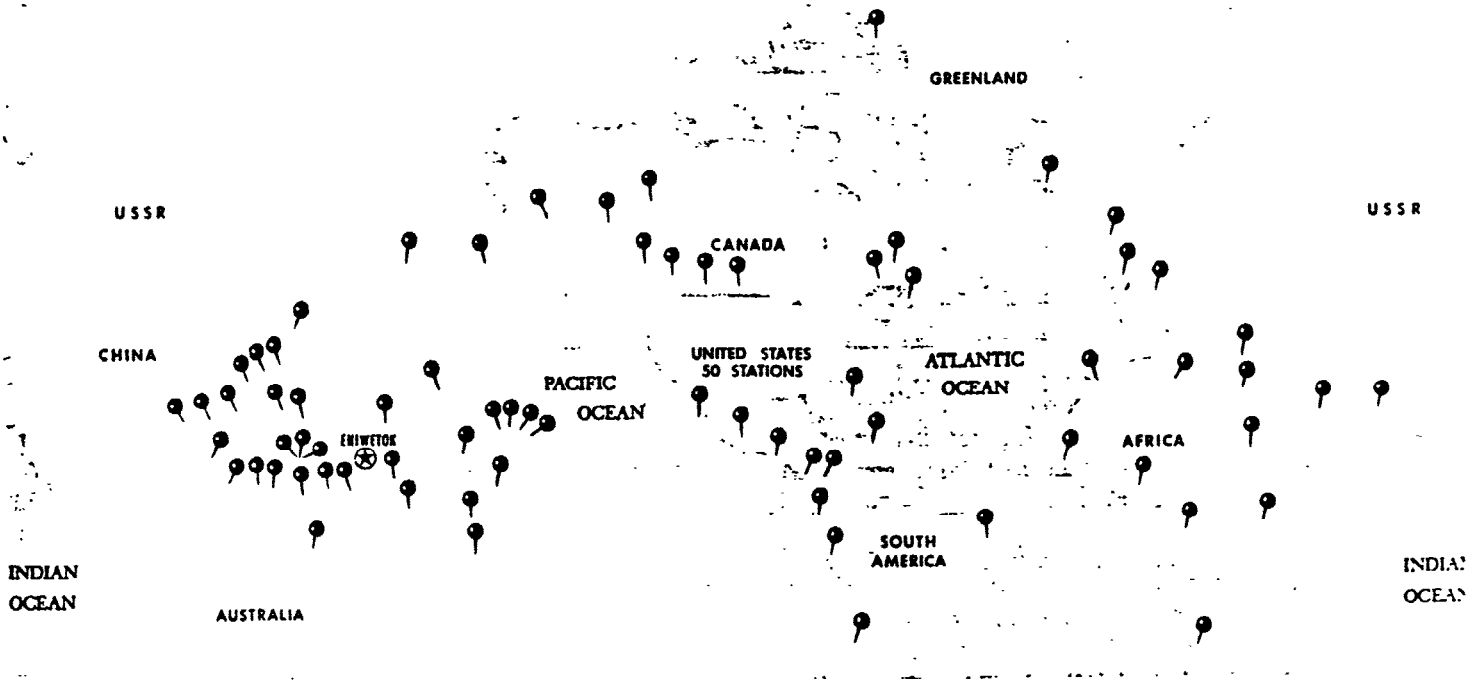
Radiation effects on range cattle. Although the Commission repeatedly informed cattle grazers and the public of the potential hazards to range cattle within the control area for the TUMBLER-SNAPPER tests, cattle were found less than 20 miles from the point of detonation on several occasions. A preliminary examination of cattle owned by a resident of Alamo, Nevada, indicated that the animals had been exposed to radiation carried in low-level dust clouds which settled in areas adjacent to the firing site. On some

cattle, patches appeared where the hair had been lost or discolored, and localized radiation damage, not unlike a burn on the skin, was observed. The injuries, involving skin areas about the size of a silver dollar, were only superficial and showed normal healing. The Commission will continue observations of some of the exposed animals.

World-Wide Monitoring Program (IVY Test Series)

In view of the valuable data obtained earlier in 1952 from the monitoring operations during the TUMBLER-SNAPPER series, the Commission expanded the system into a world-wide network for the IVY tests recently held in the Pacific. The Health and Safety Division of the Commission's New York Operations Office, in cooperation with the United States and Canadian weather bureaus, the U. S. Air Force, Navy, Coast Guard, and Department of State, extended the network across the continental United States to Canada, Europe, Africa, Central and South America, and the Pacific. Three weeks after the first IVY shot only very small traces of radioactivity had been detected across the northern part of the United States but none elsewhere in the nation. (End of [redacted] section.)

WORLD WIDE FALL-OUT STATIONS [redacted]



(End of [redacted] section.)

Civil Effects Test Program at Operation UPSHOT-KNOTHOLE [redacted]

Because of the growing need for research and experimentation in atomic weapons effects on civilian personnel, civilian structures, and services, the Commission has expanded its Continental Test Organization to include a Civil Effects Test Group in addition

to the Weapons Development and Military Effects Groups. An AEC representative in Washington headquarters has been designated as Director of the Civil Effects Test Group to coordinate all civil effects studies with the above groups.

The civil effects test presently under consideration for the spring, 1953, series (UPSHOT-KNOTHOLE) includes various projects sponsored by the Commission, the Federal Civil Defense Administration, the Food and Drug Administration, the Naval Medical Research Institute, and the Naval Radiological Defense Laboratory. These studies are to be financed by the sponsoring agencies and have been classified in nine major categories:

a. Tests of home and community shelters, typical residences, and air-zero locators;

b. Food and drug irradiation studies;

c. Civil Defense Radiological Defense Training;

d. Biomedical experiments;

e. Tests of blast effects on services and utilities;

f. Tests of civilian vehicles;

g. Physical and biological evaluation studies of fall-out near the test site;

h. Tests of the radiation telemetering system;

i. Comparison and evaluation of dosimetry methods.

(End of [redacted]tion.)

Civil Defense Activities

Meeting on Air Raid Shelters [redacted]

The Commission, in cooperation with the Federal Civil Defense Administration, has assisted the State of New York in planning the construction of air-raid shelter accommodations in the state for approximately 3 million persons, of whom 2 million reside in the city of New York. Construction costs would be expected to average $100 per person and to reach a total of about $300 million.

Representatives of the Commission met with officials of the New York State Department of Public Works, the State Civil Defense Engineer, and members of the firm, Consulting Engineers, engaged to make bomb shelter surveys in ten major cities in the state. The group reviewed information available on the suitability of ordinary building materials, the most efficient structural forms to resist blast overloading and the requirements for shielding against thermal and radiation hazards. The Commission also recommended that the state officials consult directly with the Federal Civil Defense Administration concerning criteria for shelter accommodations established by that agency as a result of previous studies.

Research Activities

Study of Fission Products

The Applied Fisheries Laboratory of the University of Washington is evaluating the uptake by aquatic animals and plants of fission products released during the IVY test operations in the Pacific. The project is a continuation of the study of radioactive contamination of the biological systems in the Eniwetok and Bikini areas, where resurveys were made prior to the test activities. Information is being obtained on the distribution of fission products in aquatic organisms and 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 are being studied for the presence of tumors and other abnormalities which have been observed to result from earlier bomb tests. (End of [redacted]ection.)

Analysis of Radioactive Soils [redacted]

New information has been obtained from the continuing studies of radioactive soil produced by the underground shot at Operation JANGLE in November 1951. As previously reported, radioactive strontium, one of the fission products, is taken up rapidly by plants growing in the soil. Recent tests, using various mixtures of radioactive and natural soils, have been conducted by the Commission in cooperation with the Department of Agriculture and the University of California at Los Angeles. Probably because of the similarity in the chemical properties of strontium and calcium, the quantity of radioactive strontium taken up by the plants appears to vary inversely with the amount of exchangeable calcium present in the soil. Additional studies will involve the use of weathered radioactive fall-out material. (End of [redacted]section.)

Study of Radioactive Particles – Radium Salts ([redacted]

Recent data from Argonne National Laboratory on the rate at which finely particulated insoluble radium salts are eliminated from the human body indicate that one-half of any inhaled material is eliminated from the lungs or body every 120 days. This information, the first reasonably quantitative data on the rate of removal, is particularly useful in the Commission's efforts to detect and prevent the development of potential radiation hazards in production processes. (Other unclassified research activities will be discussed in greater detail in the Thirteenth Semiannual Report to be submitted to the Congress in January, 1953.)

Industrial Health Program

Radiation Instrumentation

A survey of the role of private industry in the development, manufacture, and sale of radiation instruments has been completed. The survey reveals that: (1) the number of companies representing the radiation industry totaled 80 in 1952, as compared to 48 in

1948; (2) the volume of business has grown from $4.5 million in 1948 to about $20 million in 1952; (3) employment has increased from 130 people in 1944 to about 2,400 in 1952; (4) government contracts have accounted for about 85 percent of the market, and military procurement for about 50 percent of the government market today.

Neutron instrument development. During the past six months the Commission has encouraged within its installations the development of improved methods for detecting neutrons over a wide energy range and measuring their effect. One device developed for this purpose at Columbia University is the Tissue Equivalent Neutron Chamber designed to measure multiple types of radiation and to absorb neutrons in much the same way as does human tissue. This characteristic makes the instrument a valuable and useful tool in biomedical research and in the health physics program. The instrument will be made available commercially to major instrument companies through contract arrangements. (End of [redacted] section.)

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