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AEC 129/91

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ATOMIC ENERGY COMMISSION

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QUARTERLY PROGRESS REPORT TO THE JOINT COMMITTEE ON ATOMIC ENERGY APRIL-JUNE 1958

Note by the Secretary

1. The General Manager has requested that the attached report by the Controller be circulated for consideration by the Commission during the week of August 4, 1958.

2. Part II - Special Nuclear Materials, and Part III - Weapons, of the Quarterly Progress Report are being circulated separately as AEC 129/92 and AEC 129/93, respectively.

W. B. McCool

Secretary

DISTRIBUTION	COPY NO.
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Asst. Gen. Mgr. IA	9
Asst. Gen. Mgr. R&ID	10
Asst. Gen. Mgr. Adm.	11
General Counsel	12-15
Biology & Medicine	16
Congr. Relations	17
Construction & Supply	18
Finance	19-22
Industrial Development	23
International Affairs	24
Licensing & Regulation	25-26
Military Application	27
Operations Analysis	28
Production	29-30
Raw Materials	31
Reactor Development	32-33
Research	34
Special Projects	35
Secretariat	36-41

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PART VIII

BIOLOGY AND MEDICINE

PROJECT SUNSHINE (UNCLASSIFIED)

1. Monitoring and sampling of worldwide radioactive fallout continued throughout the quarter. The Health and Safety Laboratory of the New York Operations Office prepared a report which brings together all the data that have been obtained on the deposition and uptake of fallout since systematic monitoring and sampling began. 1/ The data on gummed film, surface air monitoring, Pacific Ocean water, and human bone sampling are only summarized in the report because they comprise hundreds of thousands of individual listings. However, the detailed information is unclassified and available to anyone.

Foreign Food Collection

2. Food samples were collected in Spain by a nutrition team of the Interdepartmental Committee on Nutrition for National Defense and will be analyzed for their strontium 90 and calcium content.

Stratospheric Monitoring

3. Table 1 summarizes the results of analysis for strontium 90 of stratospheric samples collected during the period November 1956 through January 1958, based on data available through June 26. It is still not possible to interpret these data in terms of strontium 90 concentrations in the

1/ Copies of this report, "Environmental Contamination from Weapons Tests - A Compilation of Data Concerning Transport, Deposition, Distribution, and Biological Uptake of Worldwide Radioactive Fallout," HASL-42, were provided to the Joint Committee. The report will be sold by the Office of Technical Services, Department of Commerce.

stratosphere because of unresolved questions regarding filter efficiency. Tests in progress should provide the answers to some of these questions. (End of UNCLASSIFIED section.)

RADIOBIOLOGICAL SURVEYS IN THE PACIFIC [redacted]

4. A number of radiobiological surveys were under way in the Pacific to monitor the radioactivity in the water and marine organisms resulting from the current test series, Operation HARDTACK. In addition, ecological studies at Rongelap Atoll will continue. Each of these programs is described briefly below.

Surveys in Connection with HARDTACK

5. Informal arrangements were made with a radiochemist of the National Institute of Health, Tokyo, for the collection of tuna samples at a port of landing in Japan. The samples will be collected at the rate of 20 samples per day five days a week for six months, a total of 2,600 samples, and sent to the Laboratory of Radiation Biology of the University of Washington. All samples will be counted for total beta and gamma activity, and a limited number will be selected for radiochemical analysis. The Japanese will retain duplicate samples, and it is expected that information on sample analyses will be exchanged with them.

6. In connection with the Wahoo underwater detonation on May 15, which was only the third underwater detonation since the beginning of testing in the Pacific, the University of Washington and the Office of Naval Research joined forces to observe the physical and biological dispersal in the water of radioactivity from that event. The Hydrographic Office Vessel U.S.S Rehoboth was used for the observation of water structure and the collection of water, plankton, and fish, both before and after the event.

UNCLASSIFIED

Table 1 - Average Concentrations of Strontium 90 in Stratospheric Samples Collected November 1956 through January 1958 a/

(Strontium 90 content expressed in micromicrocuries per 1,000 cubic feet of air, reduced to standard conditions.)

Altitude (feet)	Minneapolis, Minnesota		San Angelo, Texas		Panama Canal Zone France Air Force Base		Sao Paulo, Brazil	
	Average strontium 90 content	Number of samples	Average strontium 90 content	Number of samples	Average strontium 90 content	Number of samples	Average strontium 90 content	Number of samples
90,000	7 ± 10 b/	10	5 ± 5	14	7 ± 5	2	9 ± 9	11
80,000	10 ± 7	8	15 ± 10	11	14 ± 11	5	12 ± 8	14
65,000	24 ± 15	17	29 ± 12	10	29 ± 26	6	17 ± 13	11
50,000	9 ± 5	19	2 ± 2	10	-	0	1 ± 1	5 c/

a/ Based on data available through June 26, 1958. Analyses had not been completed on all samples collected during this period. The program calls for one sample a month from each altitude at each location. In some instances the sample was not recovered.

b/ Range shows one standard deviation above and below average. Standard deviations shown include both errors of measurement and variations in strontium 90 content from month to month.

c/ These samples were collected in the vicinity of the tropopause and probably do not represent stratospheric concentrations. The 50,000-foot sampling level is usually below the stratosphere at this location

Part VIII

7. A limited number of biological samples were collected at Eniwetok, Bikini, and a few nearby atolls prior to Operation HARDTACK and will also be collected following the test series. Personnel were to be available during the operation for other radiobiological surveys that might be needed.

8. Immediately following the conclusion of the current test series a survey similar to the post-REDWING survey of 1956 will be conducted to measure the contamination of water in the restricted area preparatory to removing the boundaries of the area. The survey will go beyond the restricted are and in general, will include the area between Bikini, Eniwetok, and Guam. Water, plankton, and fish will be collected. Gross beta and gamma counts will be made of all samples and radiochemical analyses of a limited number of selected samples.

9. Beginning in July, four radiobiological surveys were to be made during the year at Guam and Palau and in the Gulf of Siam by the Vanderbilt Foundation of Stanford University. The ocean transport of contamination from the test site to these areas requires several months. Those organisms will be collected that are most likely to concentrate radioisotopes from weapons tests (commonly called indicator species) and that correspond most closely to species sampled in other radiobiological surveys. Indicator species include fish, giant clams, lobster, plankton, and land crabs. The samples will be sent to the University of Washington for counting and radiochemical analysis.

Rongelap Ecological Studies

10. The first phase of a long-term ecological survey of Rongelap Atoll was carried out during February and March. The object of the initial study was to determine the types of soil on the atoll, their approximate distribution, their chemical

and physical properties, their relation to plant distribution, and the distribution of radioactive materials in soils, plants, and ground water. Field work consisted of reconnaissance surveys of Rongelap, Eniwetok, and Kabelle Islands, followed by detailed examination of soil profiles and collection of soil samples.

11. An integral part of the Rongelap ecology study is the continuing program of monitoring the foodstuffs of the natives. This serves as a check on the radioisotopes ingested by the natives and also provides information required for food chain studies.

12. Thirteen field rats collected on Rongelap Island during this trip were assayed for strontium 90 content of bone. The values obtained ranged from 268 to 926 strontium units, with an average value of 443. One pig bone was obtained, which gave an assay of 480 strontium units.

13. A second field trip was planned for September 1958. (End of [redacted] section.)

TREATMENT OF RADIATION DAMAGE (UNCLASSIFIED)

14. Studies continued at the Oak Ridge National Laboratory on the treatment of radiation injury by bone marrow transplants. In an experiment conducted on bone marrow cells in suspension the cells were protected from a dose of 800 roentgens of x-irradiation by removing most of the oxygen in the cell suspension just before irradiation. Protection was judged by the ability of the irradiated marrow cells to promote recovery in mice exposed to a lethal dose of radiation.

15. Various chemical compounds were administered to mice in an effort to suppress the reaction which prevents the successful transplant of foreign bone marrow. None of these

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15