

LABORATORY OF RADIATION BIOLOGY
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meeting of the International Atomic Agency, November 16-21, 1959, and was incorporated into the proceedings of that meeting.

Analyses of plant, fish and invertebrate samples selected at several islands some distance from the Eniwetok Test Site from 1954-1958 were completed during the fiscal year 1959-1960. The results of these analyses are being published as one of the UWEL reports.

A study involving the recovery of land plants which were exposed to chronic doses of radiation at the Eniwetok Test Site during 1954-55 has also been completed and is being published under the title, "The growth and radioactivity of the land plants at Eniwetok Atoll, 1954-55."

B. Rongelap Radiation Ecology Program

Supervisor: Edward E. Held

EXTRACTED FROM
ANNUAL REPORT
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The period July to August, 1959 was devoted to a continuation of radiochemical and chemical and physical analyses of samples collected on previous field trips, as well as to the preparation for the field trip of September 1959.

The field trip included observations and collections at twenty islands, and the measurement of gamma and beta-gamma dose rates at thirteen of these islands. The major collection

and study sites were Rongelap and Kabelle Islands. Soils and vegetation were resampled at previously established plots and new plots were sampled to better delineate soil types. A vegetation map of the northern half of Rongelap Island was completed; also data needed for completion of soil maps of Rongelap and Kabelle Islands were obtained in cooperation with the Trust Territory Agriculturalist. Newly planted coconut groves were treated with different combinations of chemical fertilizers. Invertebrates were collected at most of the islands visited. Reef fish were observed and collected primarily at Rongelap and Kabelle Islands, with the emphasis placed on goatfish and organisms upon which they were observed to be feeding. Plankton was collected by continuous pumping at the surface between eighty-nine stations in the lagoon. Twenty-four-hour collections of plankton were made at three depths at three of the stations. Bottom cores were successfully recovered at seventy-four stations. At Kabelle Island the transition from lagoon shore to island soil was studied, with particular attention to the formation of beach pavement and the rooting zones of plants. Twenty-four-hour rations were obtained from nine adult males at Rongelap Island.

Mr. Robert Lee, University of Hawaii, accompanied the group for the purpose of making productivity measurements of sea water

using the C^{14} technique.

Dr. I. E. Wallen, U. S. Atomic Energy Commission, Division of Biology and Medicine, spent one week with the group at Rongelap.

Personnel from the Eniwetok Field Office, (U. S. Atomic Energy Commission) accompanied the group for the purpose of making gamma dose rate measurements.

The period from October 1, 1959 to June 1960 was spent in the preparation and analysis of samples and data collected on the September field trip.

Soils. Sieving, determination of exchangeable bases, gross-beta counting, classification and mapping, preparation of samples representative of the six major soil types for radiochemical analysis.

Plants. Preparation of plant samples by drying, grinding, gross-beta counting, radiochemical analysis of edible plants, Cs^{137} and potassium determinations of selected samples from fertilizer plots and different soil types, completion of vegetation map of northern half of Rongelap Island.

Bottom Samples. Determination of composition of cores by one-inch increments, gross-beta counting of total material and fine particle size fractions, gamma spectrometric examination

of selected samples.

Plankton Samples. Qualitative gamma spectrometric examination of the total plankton collected from each of three nets of different mesh, counting of individual samples at the Co^{57} , Ce^{144} - Pr^{144} photopeaks, determination of composition of plankton by sorting of major groups.

Invertebrates. Dissection and preparation of samples, gross-beta counting, gamma spectrometric examination of selected samples, radiochemical analyses of selected samples.

Fish. Analysis for Zn^{65} content of various organs and tissues of goatfish from a single school in relation to size classes, determination of stable zinc content of samples of goatfish and organisms on which they were feeding.

Birds and Rats. Samples prepared for radiochemical analysis, but actual analyses remain to be initiated.

FOOD SAMPLES: COMPLETED RADIOCHEMICAL ANALYSIS
OF DAILY RATION FROM NINE ADULT MALES.

The period from July 1, 1960 to June 30, 1961 will be devoted to a continuation and completion of the above studies, with the addition of (1) chemical and radiochemical analysis of samples from the pot culture experiment completed at Eniwetok; (2) pot culture experiment in the new greenhouse of the Department of Botany, using Rongelap soil; emphasis is being placed on Cs^{137} ,

K relationships; (3) a field trip to Rongelap Atoll is projected for March 1961. The primary objectives are (a) to collect soil and plant samples from previously established fertilizer plots, (b) to record growth measurements on previously marked trees and shrubs, (c) to collect edible fruit samples, (d) to collect Birgus (coconut crab) for radiostrontium analysis; (4) preparation for a field trip to Rongelap Atoll projected for August 1961. This will be of similar scope to the September 1959 field trip and will require a vessel capable of operating in the lagoon and supporting the scientific party for approximately three weeks.

Members of the field party were:

Senior members

Edward Held, party leader,	Laboratory of Radiation Biology
Kelshaw Bonham,	Laboratory of Radiation Biology
Stanley Gessel	College of Forestry
Ole Mathisen	Fisheries Research Institute
Richard Walker	Department of Botany

Junior members

William Anikouchine	Department of Oceanography
Mark Behan	Department of Botany
Timothy Joyner	College of Fisheries
Reid Kenady	College of Forestry
James Kimmel	Department of Botany, Ohio State University
Conrad Mahnken	Department of Oceanography