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A PROGRAM FOR RADIOBIOLOGICAL SURVEYS AT THE ENIWETOK TEST SITE

Objective: To determine, quantitatively and qualitatively, the presence of radiosotopes in the plants and animals at the test site, in the northern Marshalls, eastern Carolines, and other islands as far westward as the Palaus. From these determinations estimates can be made of the geographical distribution of radioactive contaminants on land and in the ocean; of the radioactivity in foods eaten by the natives; of radioactivity in tuna and other fish of the commercial fishery; of the concentration of specific isotopes by organisms and tissues; of the biological fate of long-lived isotopes (from pre-test collections); of the vertical and horizontal distribution of contaminants in the ocean; and of other relationships.

Program: The types of surveys to be conducted, the areas to be sampled and the kind of samples to be collected, are essentially the same as for the Redwing Operation. The program, outlined in brief, is as follows:

I. Lagoon-atoll surveys - pre-test and post-test
   A. Marshall and Caroline Islands
   B. Palau - Saipan area.

II. Standby surveys - during testing operation.

III. Oceanographic surveys - pre-test and post-test.

I. Lagoon-atoll surveys. - Surveys are to be made both before and after the testing period. Collections will include plants and animals from the island proper and from the reef, especially food items, as well as water, plankton and soil. About 100 samples from each collecting area will be selected for quantitative measurement of radioactivity and from this group a few will be chosen for analyses for specific isotopes. The remainder of the collection will be kept in reserve for use in preparing additional samples if the analyses indicate that such are needed.

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A. Marshall and Caroline Islands. - The base for this operation is the Eniwetok Marine Biological Laboratory. Areas from which samples are to be obtained include Eniwetok, Bikini, Taongi, Uterik, Rongelap, Ponape, and Truk, or nearby atolls. These areas have been sampled previously except Taongi, which is added because Taongi appears to be in the path of a northeast surface current from the Bikini area, as shown in a 1956 paper by Uda et al. Four people can accomplish this mission in about 30 days. The pre-test survey should be completed not later than five days before the first test, and the post-test survey could begin within a week or two of the completion of the testing program.

B. Palau-Saipan area. - This operation is based at the Koror Field Laboratory of the Vanderbilt Foundation in the Palaus, and does not require field support from the Task Force. The islands at which samples are to be obtained include Saipan, Guam, Ulithi, Yap, and Palau. These islands, from 1100 to 1700 miles west of Eniwetok, are in the path of the main flow of the North Equatorial current from the Bikini-Eniwetok area. One pre-test and three post-test surveys are to be made within one year of the testing program, but at the time which the surveys are to be made can be estimated better after completion of the analyses of the Redwing samples. Four people and about 25 days are required for each survey.

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II. Standby surveys. - During the testing program no surveys would be made other than requested for an emergency situation, such as occurred on March 1, 1954. Two men at Eniwetok, working on special problems, would stand by during the testing operation for this service.

III. Oceanographic Surveys. - The oceanographic program has been changed from the plan submitted in February 1957, because a suitable vessel was not available. Present plans call for a two-part oceanographic survey and, tentatively, a cooperative tuna sampling program with the Japanese as a substitute for the combination oceanographic and fishing cruise originally planned.

The first part of the oceanographic survey will be in cooperation with the Office of Naval Research. Using the Hydrographic Office vessel the "Rehobeth", a week to ten day cruise will be made to determine the existing levels of contamination in the plankton and water near the test sites prior to the initiation of Hardtack. Immediately following the Wahoo event, the Rehobeth will be used to follow the contaminated water westward from the test site for a period of two to three weeks. During this cruise, ONR will obtain the physical-oceanographic data and the University of Washington will evaluate the contamination in the water and plankton.

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The second part of the oceanographic survey will be a three week cruise, one month after Hardtack, for the purpose of determining the contamination in the water and plankton between the test site and Guam. For this survey the destroyer-escort "Silverstein" has been assigned.

The plans for sampling the tuna in the central and western Pacific are now being formulated. A plan that would accomplish this purpose would be to sample the tuna at the port where the Japanese fishing vessels land their catch. If the samples can be identified as to place and date of capture this would be the most desirable method of sampling. Obtaining the samples should be arranged with Japanese fisheries people or other scientists and the samples shared with them if they so desired.