

Micronesian Expedition of University of Hawaii, Summer of 1946

INTENSIVE FIELD RESEARCH in several branches of natural science was carried on in the islands of Micronesia during the summer of 1946 by groups of University of Hawaii faculty members. Based on a reconnaissance made by a team of four professors in this region in December, 1945, the summer program initiated research in this oceanic area, which has long been closed to most American scientists. The University of Hawaii surveys were planned and carried out through its Pacific Islands Research Committee, headed by Dean Paul S. Bachman. Transportation, housing, and other facilities were furnished by the thoroughgoing co-operation of United States Navy officials.

Most of the scientific investigations in Micronesia have been made by the Germans and Japanese, under which nations the islands have been administered for the past half century; and these studies, some of which still have value, were published in the German or Japanese languages. Much investigation, however, still remains to be carried on in fields that have not been touched or have been treated inadequately. With the likelihood that these islands will continue for some time under the control of the United States, it appears obvious that new and full information, reported in English, will be urgently demanded. The University of Hawaii, the American university closest to Micronesia, is in an advantageous position geographically, and from it other studies of the islands will be launched and continued in the future. Its faculty includes men who by training, experience, and interest are well fitted to carry on these studies; many of these men have already done field work on other Pacific islands. The administration, moreover, has recently filled positions with other men who have particular qualifications for conducting studies in this area.

A scientific study of Micronesia has important practical values. The published findings will contribute to a better acquaintance with these territories newly under American protection and to an understanding of the clash of cultures in these scattered islands—traditionally steppingstones in the oceanic travel lanes between Asia and the middle Pacific; and these findings will provide a storehouse of scientific knowledge to be drawn upon by workers in many fields. Information is needed at once if the United States is to carry on a policy of developing the government, education, and economy of the Caroline, Marianas, and Marshall groups.

A summary of the field work sponsored by the University in the several branches of natural science during the summer of 1946 here follows.

BOTANY

A party consisting of Dr. Harold St. John, chairman of the Department of Botany, Dr. Donald P. Rogers, assistant professor of botany, and Richard S. Cowan, graduate assistant in botany, left Pearl Harbor on August 7 on LSM 382, a vessel which served as their base for most of the trip. In this Navy ship they surveyed the islands of Kwajalein, Likiep, Ailuk, Utirik, Mejit, and Wotje; thereafter they visited by seaplane the islands of Namu, Jaluit, Ailinglapalap, and Ebon. (Part of the route was planned to avoid duplicating efforts of scientists visiting Bikini on Operation Crossroads.) They returned on September 12 by air from Kwajalein, headquarters of the military government of the Marshall group.

One purpose of the trip was to make a general botanical exploration of as many of the Marshall atolls as was possible in the available time. Though these islands do not possess a large flora, they are little known because of their remoteness. Special attention was given by the University team to the ethnobotany of the crops of the natives; this subject, often neglected by the agriculturist and the botanical seeker of new species, might well reveal facts on the origins of certain crops, and studied in collaboration with qualified anthropologists might give new evidence on the migration routes of Micronesian and Polynesian native groups.

One to four days were spent on each of the islands studied, a time sufficient for a satisfactory initial exploration. In recent years, it was found, most of the islands have been turned into copra plantations, but all species of the higher plants reported by Chamisso in 1817 were found except one; these native plants were found fringing the seashore or sprouting in the coconut plantations. One of the most prominent of native trees is the pandanus—called "bop" by the Marshallese, who distinguish by name at least 20 varieties. A number of observations were made of driftwood logs found on island shores; several of these were apparently from trees native to northwestern United States. Study of these drift logs should give data on ocean currents and on the spread of certain plants in the Pacific.

An obvious gap in botanical knowledge of the Pacific is found in the lack of collections of fungi, algae, lichens, and bryophytes. Except for certain parasitic families which have been studied in Hawaii, the fungi of the main Pacific area are quite unknown. Identification of the forms collected should be a welcome contribution to mycology and should eventually add to present knowledge of distribution patterns of Pacific fungi and perhaps raise new problems in comparative morphology. For algae the region has been almost equally *terra incognita*, and the bryophytes and lichens, except those of Hawaii, have not previously been collected. The results of the summer expedition should eventually lead to the publication of several studies on the fungi and other cryptogams of the Marshall Islands.

Some 625 collections of higher plants and 500 of lower plants were brought back for further study at the University. These specimens will eventually be placed in the Bishop Museum for permanent record. Many photographs from the islands, both black and white pictures and color, were taken, as well as a number of 8-mm. motion picture films.

ZOOLOGY AND BACTERIOLOGY

A party consisting of Dr. Robert Hiatt, chairman of the Department of Zoology and Entomology, Dr. Harvey I. Fisher, assistant professor of zoology, Dr. Floyd W. Hartmann, acting chairman of the Department of Bacteriology, and two assistants, Leo Fortess and Eveni Levi, left by air from Honolulu on July 17, and after a 5-day stay at Guam, went to the island of Yap by LCI. After a stay of almost a month, they left Yap on August 22 by air and returned, via Saipan and Guam, to Honolulu on August 28. Dr. Fisher collected vertebrate specimens and Dr. Hiatt collected invertebrate specimens.

The ornithology, mammalogy, and herpetology of the Micronesian chain have been virtually unknown to English-speaking students. Study of the vertebrate fauna in this area is of interest from the viewpoints of taxonomy, distribution, and natural history, because detailed studies are available for certain surrounding regions. One purpose of the survey was to note the movement of bird species from the Asiatic continent southward and also eastward into the Palaus and the Marianas chain, as well as movement northward within this chain; in other words, to compare the avifauna of Yap with that of Peleliu and Guam. A complete zoological exploration of the Yap islands was made. About 150 skins of birds and mammals and some 50 alcoholic and skeletal specimens were brought back for further study. In addition, a number of reptiles were collected. It is hoped that present investigations may demonstrate means of saving from extinction some of the particular endemic

vertebrate species now isolated on small groups of islands or on individual islands; certainly the work will provide much new material for studies in morphology, natural history, ecology, and distribution.

No comprehensive survey of the invertebrate fauna of the Pacific islands formerly mandated to Japan has previously been made; indeed, the distribution of species west of Hawaii is virtually unknown. Studies of the specimens collected will provide information concerning the taxonomy, ecology, and distribution of these invertebrates. Thousands of marine invertebrates were collected and placed in preservatives for shipment to the University for further examination. Subtidal areas were explored with the aid of "skin" diving and "self-contained" diving techniques. The aim in exploring Pacific invertebrate life was not merely to identify and map the distribution of invertebrates in the Yap group, but also to compare these results with the dispersal of species previously known to exist in the Philippine and Indo-China area to the west and with that of species from the Great Barrier Reef of Australia to the south. Such studies might reveal the main routes of dispersal of species from the Asiatic mainland east into the Pacific. It is expected that future explorations will concentrate on island groups lying between Yap and the Hawaiian Islands.

Dr. Hartmann, in addition to collecting a number of autopsy specimens from rats in co-operation with Dr. Alicata on a study of the incidence of leptospirosis in the Carolines (see next section), carried on research on dental caries among the school children of Yap. Duplicate saliva specimens for several hundred children whose physical examinations and dental records were made available by Navy personnel were submitted to bacteriological examination. The Yap leper colony was visited, and observations were there made on administration, sanitation problems, and progress in rebuilding dwellings. A number of important bacteriological problems present themselves in the Caroline Islands, and these problems will have to be faced by the new American administration.

A large number of black and white photographs, as well as 200 colored 35-mm. slides and 2,000 feet of 16-mm. color motion pictures, were brought back as records of the 6-week visit to Micronesia.

PARASITOLOGY

Dr. Joseph E. Alicata, head of the Department of Parasitology, University of Hawaii Agricultural Experiment Station, left by air on July 18 on a visit to Truk and Ponape in the eastern Carolines, and returned August 31.

Parasitic diseases are of paramount concern in the Pacific area and are responsible for retardation in the development of island areas and in the

expansion of the livestock industry. Although scattered reports are available on the occurrence of parasitic diseases of man in Micronesia, very little is known about their actual prevalence; nor is much known about parasites which affect domestic animals. Information acquired through the present study and similar explorations planned for the future should assist in the adoption of more adequate health measures for man and, through parasite control, improved quality and quantity of animal products. The geography of parasitic diseases of the Pacific area and the factors responsible for the spread of such diseases need much investigation in order to formulate intelligent control measures.

The major purpose of the trip was to collect ectoparasites and endoparasites of economically important animals such as cattle, swine, and poul-

try, and to investigate the possible occurrence of murine leptospirosis or Weil's disease in Micronesia. Data collected in the Hawaiian Islands indicated that this disease might be widespread in the Pacific area where rainfall is usually high and rodents (the agency which usually transmits the disease) are abundant. A number of rodents were trapped in the Caroline Islands. Examination of kidney samples from these rodents for leptospirae will provide a basis for better judgment on the recognition and control of this disease in man. Dr. Alicata also carried on a study of the incidence of helminthic infection among the natives of Ponape and Truk. He experimented as well with the use of copper sulfate preparations for control of the giant land snails which destroy much island vegetation.

Survey of Micronesia by U. S. Commercial Company, 1946

An economic survey of Micronesia by 25 specialists attached to the U. S. Commercial Company was completed in the autumn of 1946. It was carried out primarily to discover how fully these formerly Japanese-mandated islands could be developed to promote the welfare of the native populations.

A comprehensive report is in preparation for the benefit of government agencies and others concerned. It is expected that this will contain factual data of value in determining future policies with reference to the islands, particularly as regards the fostering of a self-sustaining native economy and the avoiding of commercial exploitation.

Teams of scientists were assigned to remain in the various areas for a minimum of 3 months of observation. In addition to six area economists, specialists on the study included botanists, hor-

ticulturists, agronomists, animal husbandry specialists, entomologists, soils experts, nutritionists, mineral geologists, water geologists, fish specialists, and specialists in handicrafts.

An LCI, made available by the Navy, carried the several specialists from island to island throughout Micronesia, and in port served them as a floating laboratory and base of operations. This vessel returned to Honolulu at the end of the survey, carrying specimens, records, and samples of native-made products. Many of these latter will find their way into the collection of the Bishop Museum.

The study was carried on originally under the direction of Dr. Douglas L. Oliver, who retired in September as head of the agency for the Middle Pacific. At present the work is headed by Richard B. Black, former expedition director.