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PONAPE: A PACIFIC ECONOMY IN TRANSITION

BY

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PREFACE

This study was written in 1946 as volume 8 of the U.S. Commercial Company's Economic Survey of Micronesia. The U.S.C.C. survey covered the former Japanese mandate under the League of Nations, and was undertaken for the U.S. Navy in anticipation that the area would become, as it later did, a Trust Territory of the United States. Its objectives were twofold: to determine the resources and the economy of a region little known to Americans and to propose policies and a program for its economic rehabilitation and development. Volume 1 of the survey's report contains general recommendations for the area as a whole and has been published (Oliver 1951b).

Readers should be warned at the outset that in this study they will encounter not only the "ethnographic present," a common convention in which the present tense is used to describe a situation as it was in precontact times or at the time an anthropological study was made, but also the unfamiliar present and future tenses of a study in applied anthropology published long after it was written. It should be approached as a second edition, with only minor revisions, of a work which was published in 1947 in a limited mimeograph edition by the Pacific Science Board. Some changes in tense have been made to assist the reader, but to change tenses throughout would have necessitated the elimination of the projections and recommendations, which are the essence of applied anthropology.

The U.S.C.C. survey was a major undertaking in applied anthropology, as well as a large-scale interdisciplinary research project involving a team of more than twenty specialists, of whom five were anthropologists. Douglas L. Oliver, as U.S.C.C. Special Representative in the Pacific, organized the survey and served as its director. Leonard E. Mason was assigned to the Marshalls, the author, William R. Bascom, to the Eastern Carolines, Edward T. Hall, Jr. and Karl J. Pelzer, a geographer from the Department of Agriculture, to the Central Carolines, and John Useem, assisted by Paul Breese and Kaoru Uyehara, to the Western Carolines. Commander Edward E. Gallahue, an economist on leave from the Department of Agriculture, covered the Marianas.

A second group, consisting of technical specialists, visited those with regional assignments, and for the most part traveled through the area using a Navy LCI as their hotel and office as well as their means of transport. The technical team included Howard G. MacMillan of the U.S.C.C. as horticulturalist and leader of the agricultural group, F. Raymond Fosberg of the U.S.C.C. and Edward Y. Hosaka of the University of Hawaii as botanists, Richard G. Oakley and Henry K. Townes both of the Department of Agriculture as entomologists, Paul A. Gantt of the University of Hawaii as animal husbandry specialist, Robert O. Smith of the Department of Interior as fisheries specialist, Elmer Alpert of the United States Public Health Service as nutritionist, Richard Lyman, Jr. of the U.S.C.C. and John C. Ripperton of the Hawaiian Agricultural Experiment Station as agronomists, Oliver C. Rogers of the Department of Agriculture as soils scientist, Arthur M. Piper of the Department of Interior as water resources geologist, Josiah Bridge of the Department of Interior as minerals geologist, and William D. Mark of the Reconstruction Finance Corporation as mining engineer.

Richard B. Black, as expedition director, and Howard J. Trueblood, as head of field staff, traveled with the technical team. Assistance in the field was given by Clarence Wong, Anthony Aki, Simon Provincher, and by members of the U.S.C.C. operational staff in the area. Mrs. Ella Embree, Mrs. Marjorie Aki, Miss Patricia McCann, and other members of the staff of the U.S.C.C. Honolulu office also furnished assistance, as did Edwin H. Bryan, Jr., who served as geographer for the survey.

The technical group spent several days on Ponape in August, when I was able to benefit from their expert knowledge through the identifications of fish made by Smith and of plant pests and diseases by Oakley, and through Fosberg's identification of plants that I had informants bring in to him or that I had previously collected. Their cooperation and assistance added greatly to this study.

As an experiment in team research, however, the project was hardly ideal, largely because of the postwar conditions in the area. The LCI left much to be desired as a means of travel. It broke down, causing a considerable delay and the curtailment of the planned itinerary. Conditions aboard were crowded and uncomfortable and not conducive to concentrated work on field notes made during hurried visits ashore. Moreover, transportation was so short on the islands themselves that it was often impossible for members of the traveling team to visit the locations that were critical to their specialty. Although the first few who rushed ashore might be able to find jeeps to share, the others were often left to wander about near the point of landing. The anthropologists and others with regional assignments had pleasanter conditions and far better opportunities for their work.

The greatest disappointment came when the sixteen volumes resulting from the study had been written. The government provided no funds for publishing the completed reports, as had originally been planned, despite the resources mobilized for the survey and the funds expended on it.

Nevertheless, in the words of its director:

> . . . the Survey represents the successful pooling of the knowledge and observations of many different kinds of specialists all working on one highly complex problem. Its subject matter is the lives and welfare of thousands of innocent victims of an international rivalry beyond their understanding and even further beyond their control. Its objective is the sobering one of attempting to prescribe a way of life for people who have no effective voice in deciding their own destinies.
>
> Another noteworthy though incidental fact about this document has been its effect: now, four years after it was written, there is evidence that many of its recommendations are actually being carried out —a rare and exhilarating experience for most scientists who venture into the practical world of affairs. (Oliver 1951b, vi.)

In February 1944 the town of Colonia, or the Colony, on Ponape was attacked by American bombers and burned to the ground. New homes hidden in the hills behind the Colony were built by the Japanese and they escaped serious damage although Ponape served for routine practice raids by American planes for months afterward. The island of Ponape was highly fortified, but it surrendered peacefully on September 15, 1945, and all Japanese and Okinawans were evacuated by the end of December 1945. Four months later I arrived on Ponape to begin my four months of field work, from April 29 to August 23, 1946. Those with regional assignments reassembled in Hawaii for ten days in September, and this report was written in the fall of 1946 after I had resumed teaching at Northwestern.

My own assignment in the Eastern Carolines covered most of the Ponape Branch Bureau, stretching from Kapingamarangi 400 miles to the southwest of Ponape to Kusaie 300 miles to the east; but no interisland transport was available and I was unable to leave the area covered by the map that serves as a frontispiece.

I am not able to record here what specific action, if any, was taken on the recommendations made in this study or what the situation is on Ponape today. Those who have visited the island more recently have reported that things are going well, but I do not have detailed information. To bring this study up to date would have required another visit, which to my regret other commitments have prevented. Ponape is a truly beautiful island, the closest to a tropical paradise that I have ever visited, and its people are charming, gracious hosts and informants.

In effect a restudy began in the following year, 1947, under the Coordinated Investigation of Micronesian Anthropology (C.I.M.A.) project, when Saul H. Riesenberg made an ethnographic study on Ponape, R. I. Murril made a physical anthropological study of the Ponapeans, Paul L. Garvin studied the Ponapean language, and others did research on Kapingamarangi, Kusaie, and Mokil. Garvin worked out an orthography for writing Ponapean to replace the five systems he found for the island's population of less than 6,000 (Garvin 1954). I have nevertheless retained here the orthography of my original report, which is explained on pages 63-64. From 1949 to 1953 Jack L. Fischer did field work on Ponape as an employee of the American administration. He reports that as of June 1951, 798 parcels of government land totaling 2,284.5 hectares had been leased to natives by the American administration, including both former wilderness and land developed by the Japanese (Fischer 1951:24; 1958a:121). The bibliography prepared by Eugene Anderson that has been added at the end of this volume attempts to cover both early and recent publications relevant to Ponape.

Clyde Kluckhohn, returning from the Pacific, once went out of his way to visit me in Evanston to tell how the succession of later visitors to Ponape had used this study and had confirmed the information it contains. Its accuracy, which shows that extensive sampling is not always as necessary in anthropology as some sociologists maintain, is due primarily to the sophisticated observation and broad knowledge of one man, who served as interpreter and principal informant. More than thirty informants were consulted, but the great bulk of the information gathered on Ponapean culture was supplied by Thomas Nānipēi, to whom I am deeply indebted.

Although this study has been cited frequently, the only serious question of its accuracy of which I am aware has been raised by Jack Fischer. He challenges my statement that the inheritance of land was matrilineal in Ũ District (see pp. 21, 69-70), but patrilineal in other districts, whereas descent and accession to chieftainship was matrilineal in all districts. The following quotation is from the most recent statement (Fischer 1958a:78, 83-84), which involves only minor revisions of an earlier one (Fischer 1951:2, 4-5).

> Differences between the five districts of Ponape Island in land tenure are believed to be minor. All available data appears to indicate that Ponape should be treated as a whole, although special provision must be made for some of the out island colonies on the island. Bascom's statement that Uh District had different inheritance rules for land than the other four districts, and that at the beginning of the American period Uh was seriously considering establishing matrilineal inheritance was not confirmed by data collected for this report. Certainly the Germans and Japanese did not give Uh any special treatment. . . .
>
> Bascom devotes some space to land tenure. His statement that Uh District was matrilineal and the other four districts patrilineal in the inheritance of land is questionable. He seems to be certainly mistaken in saying the Uh District was considering making inheritance matrilineal in the beginning of the American period. Probably the discussion was simply as to whether women could own land, i.e., whether daughters could inherit along with or in the absence of sons, but not in exclusion to them.
>
> A number of informants from Net, Madolenihm, and Kiti Districts reported that land was formerly held by the 'clans' before the German land reform, and that the German land reform caused great disturbance because they made it mandatory to give land to people outside of the clans. Even today people sometimes say they adopt their clansman so he can inherit land from them and keep it in the clan. If the clans, which were and are strictly matrilineal, were able to hold on to the property for long periods inheritance of land would necessarily be at least partly matrilineal.
>
> Bascom's statement that inheritance of land was patrilineal while inheritance of the chieftainship (presumably including section chieftainships) was matrilineal is hard to understand, since some of the sections were quite small and contained only a couple of families and were little more than glorified farmsteads.
>
> More feasible would be that the inheritance of land was probably in the process of gradual change from matrilineal to patrilineal when the Germans came and suddenly accelerated the process. It may have also been accelerated by previous foreign contact and missionization. The old gods of the Ponapeans were clan gods and had special altars or 'homes' on the land of clan members. Christianity reduced the importance of these gods and thus weakened one of the sanctions which kept land in the hands of the same clan.

My informant for land tenure in Ũ was the Nänikẹn (B1) of that district. His statements, as translated and transcribed directly by typewriter, were as follows:

> In olden times, a dead man's children did not inherit the land; it passed to the man's brother, to his eldest living brother. If a man had no brothers,

> the chief chose a member of the clan. A man's sons could never inherit if he had many clan members. This was pre-Spanish custom and it continued up through the Spanish period. It was this way all over Ponape, and just not in Ũ. The Germans changed inheritance when they divided the land and established private ownership. The Germans didn't like matrilineal inheritance. In the old way women did not inherit the land. . . .
>
> People didn't like the change to the German system, but they could not say anything about it. Military government is going to let them choose which way they think is best for Ponape. In Ũ, people haven't yet made up their minds. It is a difficult choice to make, because they would like to pass their land on to their brother, but they are thinking of their children. They think it is best to divide the land among the children.

Land thus originally remained within the matrilineal clan of the father, passing to his brother who belonged to the father's clan; and there was still some sentiment for reverting to matrilineal inheritance, although there was the conflicting desire of men to transmit land to their own children. In other districts the original pattern was said to be that the father's land was inherited patrilineally by his sons, who belonged to a different clan, rather than by a member of his own clan.

Thus the Nänmäriki (A1) of Soköş, who was himself a Mortlock Islander, reported the following for the pre-German period on Ponape:

> When a man was sick he could divide his land into parcels and assign some to his children. None was assigned to his brothers, but the brothers came and looked after the children as the man himself had done before he died. None was assigned to girls; only boys shared the land. The brothers only kept the children; they had no right to remove the children from the land. The land-use right belonged to the sons, not to the brother. If a man died without making such a division, the land was divided between his sons by his brother. The brother never inherited the right to live on the land or use it. This was what I saw before the Germans divided the land. It is what was done in the Spanish times and before that.

The Nänikẹn (B1) of Kiti, a knowledgeable informant, stated:

> In olden times the paliẹnsap was owned by the man who planted breadfruit on it. If such a man had two sons and two daughters, his land would be inherited by them at his death. . . . Before a man died, he would divide his farmstead into parts and assign them to his children. Boys and girls alike inherited a part. All the land went to a man's own children.

My reference to the matrilineal inheritance to chieftainship (see p. 69) was meant to refer only to district titles; section titles are achieved through prestige competition (see p. 32) and "are independent of clan affiliation except in Ũ District" (see p. 27).

In a personal communication dated 23 May 1961, Fischer writes:

> I am increasingly inclined to think there may have been some important local differences in residence and land tenure in aboriginal times between different parts of the island. I suspect that somehow the same concepts were used but that they were given different emphasis in different groups. I did not, however, hold this position at the time I wrote the report, since I trusted my informants all of whom said land tenure customs were the same through Ponape before as well as after the German land reform.

The original version of this study follows the outline provided by Douglas Oliver for the five regions of the mandated area. The outline has been simplified, but has been followed with the exception of the combination of hunting with fishing as a single chapter. Had I been writing an ethological study of Ponape only, I would have followed a different outline to bring land tenure, inheritance, religion, and other topics together more closely. However, in order to show more clearly the problems of applied anthropology and interdisciplinary research, the original form of the report has been preserved. A few minor deletions and some corrections and editorial changes have been made, and a historical summary has been added at the end of chapter 9.

I wish to dedicate this work to Thomas Nänipẽi, who made it possible; to my wife, Berta, for whom Ponape meant more anguish than any of my other field trips; and to Ralph Linton, who first interested a physics student in anthropology during an introductory course taken as a senior and who converted him to anthropology in a course on Oceania audited as a graduate student while he was preparing the necessary apparatus for doctoral research on electronic emission.

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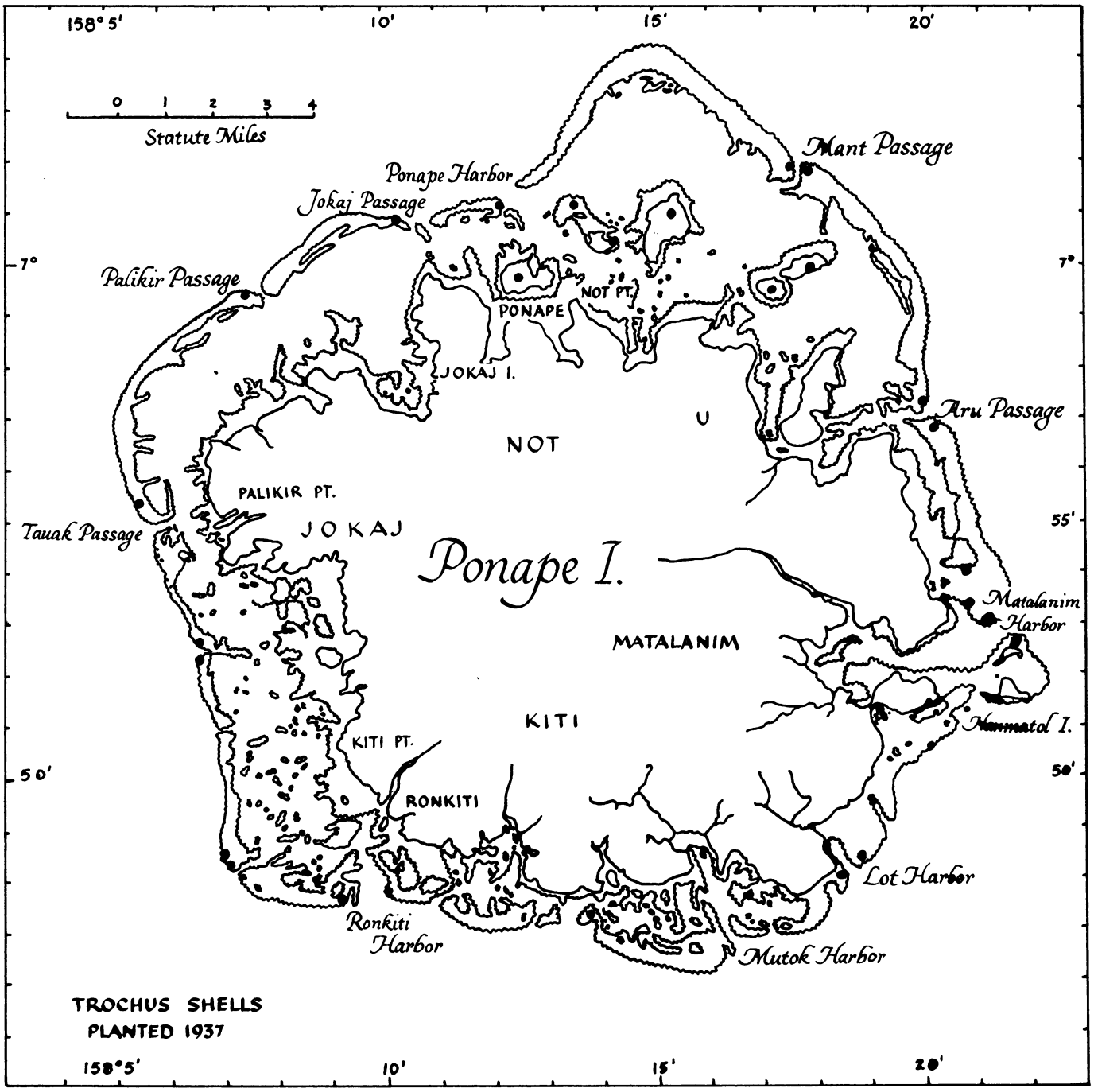
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PONAPE: A PACIFIC ECONOMY IN TRANSITION

BY
WILLIAM R. BASCOM

1. GEOGRAPHY AND DEMOGRAPHY

CLIMATE

The climate of Ponape is characterized by uniform, mild temperatures and high rainfall and humidity, with little variation throughout the day or year. During three years from 1927 to 1929 the temperatures at the Colony ranged between a maximum of 91.9° and a minimum of 67.6°, with an annual average of 80°. Ponape and Kusaie in the Eastern Carolines have the highest humidity in the mandated area, and, with Palau, the heaviest rainfall. Records made over a seven-year period under Japanese rule show humidity at the Colony averaging 86°, annual rainfall 4,713 mm (185.5 inches), and an average of 309 rainy days per year. Averages by months and annual monthly averages at the Colony during the periods cited above are given in the table below.

As this table shows, there are no periods that can be described as cold or dry seasons except by comparison. The small seasonal variations are more clearly shown in trimestral averages (table 2) than in the monthly averages (table 1) on which they are based.

Ponapeans speak of a "sunny season" (January-March) and a "rainy season" (April-September). From table 2 it can be seen that the latter includes two fairly distinct periods, one (April-June) with very heavy rainfall and another (July-September) with below-average rainfall but very high humidity. The meteorological records show no basis for the term "sunny season," in which there are said to be more frequent breaks in the overhanging clouds. Cloudiness was rated by the Japanese on a scale ranging from 0 for a cloudless sky to 10 for a completely overcast sky. The mean cloudiness on this scale for a seven-year period was 8.3, with the lowest averages (8.0) recorded for August and October, and the highest (8.7) for January. During the three-year period 1927-1929 only ten really clear days were observed on Ponape.

Although cloudiness, high humidity, and heavy rainfall continue throughout the year, there is a noticeable seasonal difference between the period of trade winds and the other months of the year in the percentage of calm weather and to a lesser degree in wind direction and velocity. Winds from the east and northeast predominate throughout most of the year, but there is a shift toward the south in wind direction during the months of July-September, which are marked by calms and short unpredictable squalls.

The climate varies somewhat from one part of Ponape to another. There is less rainfall on the leeward side of the island, whereas in specific localities like Nänipïl (which means "in the water") Section in Nęt District, rainfall is said to be extremely high, as it is in the mountains, where it is also cooler. Observations have been taken only at the Colony (figures cited above), at Medschenien in Ü District, and Rönkiti in Kiti District. For the station in Ü an average temperature of 80.1° with a maximum of 90.4° and minimum of 68.0° was recorded in one year 1900-1901, and an annual rainfall of 4,615 mm and an average of 274 cloudy days annually for the period 1900-1911. For

TABLE 1

Monthly Temperature, Humidity, and Rainfall at Colony, Ponape

Month	Temperature (°F)	Humidity (per cent)	Rainfall (mm)
January	80	80	335
February	80	79	255
March	82	80	270
April	80	84	476
May	80	85	513
June	79	87	428
July	79	90	420
August	78	91	341
September	78	91	376
October	79	90	420
November	79	88	374
December	80	85	505
Monthly average	79	86	393

TABLE 2

Seasonal Variations in Temperature, Humidity, and Rainfall

Period	Average monthly temperature (°F)	Average monthly humidity (per cent)	Average monthly rainfall (mm)	Weather
Jan-Mar	81	80	287	Dry, trade winds
Apr-June	80	85	472	Heavy rainfall
Jul-Sept	78	91	379	Humid, calms and squalls
Oct-Dec	79	87	433	Rainy
Annual monthly average	80	86	393*	

*Total annual rainfall 4,713 mm.

TABLE 3

Seasonal Wind Directions and Velocities on Ponape

Period	Calm (per cent)	From NE and E (per cent)	From SE and S (per cent)	From SW and W (per cent)	From NW and N (per cent)	Velocity (knots)
Jan-Mar	4	90	5	0	1	7.1
Apr-June	21	61	15	2	1	4.9
July-Sept	28	23	30	12	7	2.8
Oct-Dec	21	40	29	6	4	3.9
Annual monthly average	19	53	20	4	4	4.7

Rönkiti an annual rainfall of 4,268 mm and an average number of 258 cloudy days were recorded in 1910-1911.

Kusaie, like Ponape has heavy rainfall and excessive humidity. At Lele on Kusaie the annual rainfall was 4,755 mm and there were on the average 249 cloudy days each year between 1903-1911. At Mwot during five scattered years between 1895 and 1904 the annual rainfall averaged 6,473 mm (254.8 inches) and the number of cloudy days 279. Figures for the other islands within the Ponape Branch Bureau are not available, but it is to be expected that they would show the usual contrast between atolls and high volcanic mountains like Ponape and Kusaie, that is, lower rainfall, lower humidity, and more sunshine

CLIMATE AND PRODUCTION

It is commonly believed that tropical climates and weather conditions in themselves lower energy and limit intensity and continuity of work, but so far as is known this has never been demonstrated by scientific observations or experiments in which other factors such as disease, nutrition, and custom have been controlled. Ponapeans do not take siestas during the day, and the customary hours of wage laborers allow only an hour for lunch. Rainfall interferes with most types of outdoor activities. It is customary for Ponapean field hands to stop work and seek shelter when a heavy shower begins but in some situations, such as when traveling by canoe or fishing on the reef, a man may find little in the way of shelter or there may be no point in trying to keep dry. Travel by canoe is also affected by storms and the amount of wind.

Although seasonal variation in climate is slight, it has recognizable effect on agriculture. Some crops can be planted and harvested throughout the year regardless of season, but many bear and ripen only during certain months. The seasonal nature of the major subsistence crops is to a large extent overcome and even obscured by the cultivation of a number of different varieties bearing at different times. The relatively drier season of the trade winds is the best time for drying copra. It is also the period in which most yams are harvested and replanted, when the mountain farms are prepared, and when turmeric is used in cooking and dying. The humid season following the heavy rains, and in particular the months of June-August, see the harvest of breadfruit, mango, guava, soursop, mountain apple, citrus, pineapple, pandanus, and corn. In the following period, particularly from September to November, taro, "Hawaiian taro," pumpkin and squash, cassava, sweet potatoes, and "chestnuts" are ready for harvest. The main yam harvest is about December and January. Cloudiness, heavy rainfall, and excessive humidity make copra-drying difficult on Ponape at any time of the year.

TABLE 4

Islands Within the Ponape Branch Bureau

Name	Formation	Location of center of lagoon or island	Distance from Ponape (in nautical miles)	Area of dry land (in hectares)
Ponape	Volcanic	6° 54' N. 158° 14' E.	0	33,421*
Ant	Atoll	6 47 157 58	8 SW	186
Pakin	Atoll	7 03 157 48	18 WNW	109
Oroluk	Atoll	7 32 155 16	164 WNW	50
Ngatik	Atoll	5 50 157 17	75 SW	175
Nukuoro	Atoll	3 51 154 58	251 SW	167
Kapingamarangi	Atoll	1 04 154 46	415 SW	135
Mokil	Atoll	6 40 159 47	88 E	124
Pingelap	Atoll	6 13 160 42	163 ESE	175
Kusaie	Volcanic	5 19 162 59	307 ESE	10,960
Ujelang	Atoll	9 49 160 54	270 NE	173
Eniwetok	Atoll	11 30 162 14	410 NE	585
Total area, Ponape Branch Bureau, 240 islands and islets				46,260

*Figures as compiled by Research Section, U.S.C.C. Survey. Other sources give: Ponape 37,500 hectares, Oroluk 10 hectares, Ngatik 144 hectares, Kusaie 11,600 hectares, and total for Ponape Branch Bureau, 138 islands with 50,400 hectares.

Because of the heavy seas during the season of the trade winds, the fishing boats of the Okinawan and Japanese bonito fleet laid up for repairs during the months of January and February.

Both the climate and the soil of Ponape permit the growth of a wide variety of tropical crops as well as trees suitable for lumber. In addition there is a rapid growth of a variety of vines and weeds that interfere with agriculture. Except for pandanus, of which the types best suited for handicraft are found only in small numbers, and coconuts, most crops grow far better and easier than on the drier and less fertile atolls. The heavy rainfall provides ample fresh water for drinking and washing, but supplies of storage tanks and cisterns are inadequate.

TOPOGRAPHY

Ponape is a high volcanic island located at 6° 54' N, 158° 14' E, in the Eastern Caroline Islands. It lies 383 nautical miles east of Truk and 307 miles west northwest of Kusaie; the distance to San Francisco is 4,641 nautical miles, to Honolulu 2,685, to Manila 2,363, to Yokohama 1,998, and to Guam 901. Ponape and two small nearby atolls form the Senyavin Islands; the atoll of Ant lies eight miles away to the southwest, and Pakin eighteen miles to the west northwest.

Ponape has the largest area of all the islands of the former Japanese mandate except Babelthuap, in Palau. Its 33,420 hectares (129 square miles) constitute three-fourths of the land mass of the Ponape Branch Bureau and one sixth of the total mandated area. It is also the highest of the Caroline Islands. In the rugged mountainous interior eleven peaks rise above 2,000 feet, the highest reaching 2,595 feet. The main island, which is volcanic in origin and has a maximum diameter (East-West) of 13 miles, is encircled by a coral reef that is separated from the inner reef along the shore by the deep water of the lagoon, except in the southeast where an almost solid fringing reef extends from the shore out to the open sea. In addition to the main basalt island, there are a number of alluvial mangrove-covered islands and twenty-three small basalt islands lying within the lagoon, and some fifteen small coral islands in the outer reef. Near Matälanim harbor in the east are some fifty man-made islands which were built up artificially on the fringing reef in an unknown period and on which there are archeological ruins.

Both the outer reef with its sand banks and low coral islets and the main volcanic island are roughly pentagonal in shape, though the latter is deeply indented with bays. In some places the shore consists of steep cliffs over which flow several waterfalls remarkable for their beauty. Although the solid rock cliff on Sokȫs Island is a prominent landmark and probably the most commonly illustrated portion of Ponape, it cannot be taken as typical of the shoreline. In most parts of the island the shore is fringed by a belt of mangroves growing on the inner reef, with the foothills rising only a short distance behind a narrow belt of level land.

Ponape is divided into five districts which in shape are not unlike the pieces of a pie. Each district includes mountains and forests, coastal plain and shore, and small islands on the outer reef. The five districts are named Kiti, Matälanim, Ü, Nȩt, and Sokȫs (usually spelled Kiti, Matalanim, U, Not, and Jokaj).

Ponape served as the administrative headquarters for the part of the Eastern Carolines and Western Marshalls known as the Ponape Branch Bureau. The Bureau included the islands of Ponape, Ant (which was considered by the Japanese and Ponapeans as a part of Kiti District), Pakin (considered as a part of Sokȫs District by Ponapeans but treated separately by the Japanese), Oroluk, Ngatik, Nukuoro, Kapingamarangi or Greenwich, Mokil, Pingelap, Kusaie, Ujelang, and Eniwetok and Enjabi (Engebi). There are historical, geographical, and economic reasons for maintaining

Ponape as the administrative headquarters of these islands, with the possible exception of the Marshall atolls of Ujelang and Eniwetok (which includes Enjabi). The locations of the various islands within the Ponape Branch Bureau are given in table 4.

RESOURCES

The principal subsistence crops of Ponape are breadfruit and yams, but forty-two different wild and cultivated plants are used for food by Ponapeans, and others were produced locally by the Japanese for their own use. The farms and forests also yield lumber, fibers, dyes, flowers and perfumes, and materials for thatch, baskets, clothing, and other handicrafts. Pigs, cows, carabao, goats, sheep, chickens, and other fowl are raised, and wild pigs, chickens, deer, and birds are trapped and hunted. The waters of the lagoon yield a variety of fish, shellfish, trepang, and other marine produce that provide food and materials for handicraft.

Exports in the past have included copra, bonito and other fish, hibiscus bast, coconut-leaf fiber, coconut-husk fiber, ivory nuts, cassava, alcohol from sugar cane, kava, an unidentified forest product known as usęl ęn thöng, lumber, mangrove bark, trepang, black pearl, and tortoise shell. Trochus and canned pineapple and mangoes were being developed for export. In addition, paper and paper pulp, tobacco and cigarettes, cotton cloth, charcoal, ivory-nut buttons, salt, molasses, liquor, kava, coffee, rice, and a large number of fresh vegetables were produced commercially by Japanese and Ponapeans for local consumption.

Christian said that Ponape "really deserves the name of the garden of Micronesia." In the fertile soil of its coast and valleys most tropical plants grow luxuriantly. The belt of flat land between the shore and the foothills along which the native farms are scattered is narrow in most parts of the island, particularly in sections of Ü and Matälanim districts and on the island of Sokȫs, where farming must be done on the slopes of the foothills. In Palikir, however, there are broad valleys in which the Japanese developed farms growing vegetables, pineapples, and paper pulp on a large scale, and near the Colony the hills rise some distance inland from the shore. The small basalt islands, which are detached segments of the main island, resemble it in both geology and vegetation; the small coral islands of the outer reef, on the other hand, are comparable to islets of the Micronesian atolls.

In the mountainous interior of the main island, which is uninhabited, there are wild birds and animals as well as many wild plants. Although the central parts of the island are probably unfit for agriculture, the rolling slopes and level surfaces of the foothills could be used to a greater extent than they are by the present native population. Evidence of this is seen in the successful sugar and copra plantations developed in Matälanim by the Japanese and in the stone platforms of abandoned native houses dating back to the smallpox epidemic or earlier that can be found in the foothills behind the Colony. In recent times the foothills have been used mainly for the shifting "mountain farms." The population of Ponape today is roughly a third of what it was before contact, and a fourth of what it was during the war. Unlike many islands in the mandate, the land resources are adequate and there is no reason to doubt that the island could easily support a much larger population than it has at present.

The mangrove swamps provide useful woods as well as crabs and certain fish and shells. The reefs and coral heads of the lagoon supply most of the marine products consumed by Ponapeans, and the open sea was fished for bonito by the Japanese and for subsistence food by the out-islanders who lived on Ponape. Streams and rivers provide fresh water for washing and drinking, as well as shrimp, eels, and certain fish eaten by only a few people. The fresh-water marshes and muddy beds of certain streams are used for growing Cyrtosperma, and the former were used successfully by the Japanese for wet rice. Fishing, hunting, farming, and travel are all affected by the rhythm of the tides.

TRANSPORTATION

Because of the mountain streams, the steep gorges, and the heavy undergrowth, travel in the interior is extremely difficult. Trails were hacked out by the Japanese across the mountains from the Colony in the North to Matälanim District in the east and from Matälanim to Kiti District in the south, but these are already overgrown and will soon be lost to the jungle. The uninhabited interior of the main island is visited by Ponapeans only for hunting, trapping, gathering, and occasional fishing, with the stream beds serving as the means of access.

Roads and paths are confined mainly to the belt of farm land along the shore. Road building is difficult because of the rock outcroppings, the mangrove swamps, the rivers, and the steep hills. A narrow road around the island was begun by the Spanish and Germans, but some bridges were not built and in parts of Matälanim District the road is little more than a footpath. The project was left unfinished by the Japanese, and the Americans contributed only to repair and maintenance in the immediate vicinity of the Colony. District administrations were encouraged by Military Government to keep their roads cleared and they decided that work on the roads should be substituted for taxes until the people could earn some money. The completion of the road in Matälanim District on this basis was discussed, but there was little evidence of progress in September of 1946. Travel by car was possible at that time from the eastern border of Ü District almost to the northern border of Kiti District, provided that some of the rotten wooden bridges had not collapsed. There were a few side roads in Nęt and one to the top of Sokȫs Island. The only automobiles in operating condition were owned by Americans. On land Ponapeans traveled by foot, mainly along the German roads. A few used carabao and carts, which were Military Government property.

Most transportation is by water within the lagoon since Ponapean canoes rarely venture out beyond the reef. These canoes are built with an unusually shallow draft that permits them to pass over the reefs and coral heads studding the lagoon, which Mokil and other types of canoes can cross only when the tide is fairly high. Combining poling with paddling, Ponapean canoes can travel in a fairly straight line except at quite low tide, whereas deeper canoes and boats must wind in and out of the reefs, particularly in the region between Rönkiti harbor and Muthǫk Island, where it is necessary to spend more time and distance going back and forth between the inner and outer reefs than in traveling along the shore. From Muthǫk to Matälanim Harbor, where the true fringing reef is found, only canoes can travel inside the breakers and even small boats must

TABLE 5

Native Population of Ponape Island, 1946

District	Adults*			Children**			Total
	Men	Women	Total	Boys	Girls	Total	
Kiti	515	463	978	290	280	570	1,548
Matälanim	398	366	764	190	159	349	1,113
Ũ	298	255	553	186	140	326	879
Nęt	301	237	538	163	167	330	868
Sokȫs	378	309	687	196	171	367	1,054
Total	1,890	1,630	3,520	1,025	917	1,942	5,462

*Persons more than 17 years old.
**Persons less than 17 years old.

go out into the open sea. In several places shallow channels have been dug or blasted across the reefs to permit the passage of boats at lower tides.

The outer reef is broken in about twenty places, allowing the passage of small boats and canoes. Three of the larger passages (tän, kapatau) lead to the Colony in the north, matälanim in the east, and Rönkiti in the southwest where the principal harbors were located; two others lead to harbors of lesser importance at Löth in the southeast and Muthȫk in the south. At the main harbors in the north and east the two chief Japanese towns were situated. The Colony, or Colonia, which has been the seat of government and the principal port since the Spanish period, had about 4,000 Japanese inhabitants; Sapalap, which grew up near the mouth of the Lęthau River in Matälanim when the Kohatsu plantation was developed by the Japanese, had about 3,000.

The tide regulates all travel and transportation by boat. The boats and sampans left by the Japanese cannot get in and out from shore at low tide except in a few places. Boats are continually running aground on reefs and coral heads even out in the lagoon. Usually nothing is damaged, but there may be long delays unless the passengers and crew can push the boat off into deeper water. High tide is necessary when boats enter or leave the shallow streams leading through the mangroves in Kiti District to pick up copra. By towing a canoe it is usually possible for a traveler to pole to shore after anchoring his boat in deep water, but when the tide is low enough to expose the reefs the only alternatives are to get out and wade ashore across the inner reef or to wait for the tide to change.

Because the farms are scattered all about the edge of the island, transportation is a major problem on Ponape. The restoration of the copra industry depends on the provision of reliable and inexpensive intra-island transportation.

EFFECTIVENESS OF MANPOWER

The widely scattered nature of Ponapean settlements around the edge of the main island and the Ponapean's preference for casual labor means that the number of individuals that can be assembled for work at any given place is limited by the speed and reliability of the transportation facilities. Travel from the Colony to either Kiti or Matälanim by Japanese diesel-powered "pom-poms" takes from four to five hours, not counting the time spent waiting for other passengers to assemble or in waiting for the tide; because of the tide the return trip must almost always be postponed until the following day. In the eastern part of Kiti District, where the mangrove swamps reach a width of a mile or more, a considerable part of the time devoted to fishing is spent unproductively in paddling to and from the fishing grounds.

Free boat transportation to and from the hospital was provided for natives from the outlying districts by Military Government, but there was no provision for transportation to and from work or for local housing for Military Government or U. S. C. C. employees as there had been under the Japanese. Laborers who wished to build their own houses near the Colony were given equal opportunity with others to obtain lumber and building supplies from buildings abandoned by the Japanese. Those who might have been willing to accept work for short periods of time had no place to live.

POPULATION

A census of the native population of Ponape, prepared for Military Government by the District Administration, dated June 5, 1946, is given above (table 5).

In addition there were about forty Europeans and Americans: seven Belgians, one Czechoslovakian who came to Ponape from the Marianas shortly before the war, about twenty Catholic missionaries of Spanish nationality, and about ten Americans in the U. S. Navy and the U. S. Commercial Company. In August 1946 the number of Spanish missionaries, who had been concentrated on Ponape during the war by the Japanese, was reduced to thirteen by the return of some of the group to Truk, and the U. S. Navy garrison was increased to about fifty.

Table 5 includes "Chamorros" from the Marianas as well as "Kanakas," a term used by the Japanese to designate natives of other Pacific islands. The latter term is not used on Ponape, and the former only occasionally.

Table 5 also includes natives from other islands who have settled on Ponape. These out-islanders have never been tabulated separately by either Japanese or Americans, although they constitute about 20 per cent of the total population according to estimates obtained from chiefs and officials of Sokȫs District; these estimates are tabulated below.

TABULATION A

Estimated Population of Out-Islanders on Ponape Island, 1946

Islands of origin	Population
Mortlocks	580
Pingelap	190
Ngatik	85
Mokil	80
Kapingamarangi	75
Nukuoro	30
Yap	65
Other	15
Total	1,120

Under "other" there were said to be about four people from Truk, four from Saipan, two from New Guinea, two from Palau, one from the Philippines, and perhaps others. Ten carpenters recruited for a few months from Kusaie by Military Government are not included.

For both economic and administrative reasons, it would be desirable to have accurate figures for resident out-islanders. It is suggested that island of origin and sib affiliation be included in the census questionnaire and that for at least one census the data be broken down into the smaller political units, as is now done for districts, so that the populations of the sections and the farmsteads or households can be shown.

The most recent figures available showing a more detailed breakdown of the population by age were for the Ponape Branch Bureau in 1940 and exclude Chamorros (table 6, below).

POPULATION TRENDS

In 1835 Pulchard estimated the population of Ponape as 15,000. Diseases introduced by American whaling ships decimated the original population; measles and syphilis took many lives, and in 1853 a smallpox epidemic spread from the ship "Delta" while she was at anchor, killing approximately 3,000 in five months. Clan and district wars and later wars against the Spanish (1887-1890) added their toll. Native estimates today of the original population run as high as 50,000, but Pulchard's figure is probably more realistic. It does not seem excessive, since O'Connell described a war a few years earlier in which Nęt District sent 1,500 warriors against Ü.

Since about 1890 the native population has gradually been increasing, but it has not yet regained its former size. In 1912 it was augmented by the arrival of 1,252 out-islanders who settled on Ponape. Table 7, below, shows the population estimates before the Japanese period.

Beginning in 1920 a complete census was made every five years by the Japanese, with annual revisions of population figures based on estimates of increase and decrease. The figures available for the island of Ponape are shown in table 8.

The figures for the years 1920-1940 are based on Japanese sources; those for 1945 are based on table 10 and do not include the members of the American occupying force; those for 1946 are from table 5. The figures marked with asterisks are estimates (see table 11).

The fluctuations in native population in the years 1934-1938 probably reflect the recruiting of natives from other islands for work on Ponape following the opening of the Kohatsu plantation in Matälanim District in 1934 and the increased Japanese immigration. Similarly the drop in population between 1945 and 1946 is the result of population movements. In October and November 1945, 170 Ponapeans were brought back from Kusaie where they had been used as forced labor on Japanese airfields, and 147 Mokil and 243 Pingelap natives were repatriated from Ponape. These changes would give a revised total of 5,604 for November 1945, which is in line with a Military Government census dated December 5, 1945, showing a population of 5,639, with 3,027 males and 2,612 females. In March 1946 about 120 natives from Ponape were recruited for work on Kwajalein and Eniwetok, revising the December 5 total downward to 5,519; again, this is not far out of line with the census of June 5, 1946. Records of other

TABLE 6

Native Population of Ponape Branch by Age and Sex, 1940

Age in years	Male	Female	Total
0-5	465	458	923
6-10	510	471	981
11-15	546	491	1,037
16-20	484	437	921
21-25	520	467	987
26-30	445	404	849
31-35	381	342	723
36-40	386	325	711
41-45	307	244	551
46-50	260	234	494
51-55	219	174	393
56-60	188	179	367
61-90	363	284	647
Over 90	0	0	0
Total	5,074	4,510	9,584

TABLE 7

Early Estimates of Native Population of Ponape Island

Year	Population	Authority
1835	15,000	Pulchard
1840	15,000	Rosamel
1844	7,000-8,000	Cheyne
ca. 1855	5,000	Kubary
1880	2,000	Finsch
1891	1,705	Mission report
1900	3,165	German administration
1903	3,266	German administration
1904	3,279	German administration
1914	4,401	German administration

TABLE 8

Population of Ponape Island Since 1920

Year	Native			Foreign	Japanese	Aggregate Total
	Men	Women	Total			
1920	-----	-----	4,165	0*	400*	4,565*
----	-----	-----	-----	--	-----	-----
1925	-----	-----	4,915	20*	350*	5,285*
----	-----	-----	-----	--	-----	-----
1930			5,320	20*	670*	6,010*
----	-----	-----	-----	--	-----	-----
1932	2,799	2,433	5,232	20	1,281	6,533
1933	2,816	2,439	5,255	21	1,411	6,687
1934	2,842	2,459	5,301	20	1,902	7,223
1935	3,144	2,610	5,754	21	2,394	8,169
1936	2,988	2,555	5,543	23	2,972	8,538
1937	3,233	2,638	5,871	25	3,602	9,498
1938	3,087	2,671	5,758	22	4,061	9,841
1939	3,192	2,713	5,905	24	6,476	12,405
1940	3,207	2,659	5,866	24	7,803	13,693
----	-----	-----	-----	--	-----	-----
1945	-----	-----	5,834*	30*	14,066	19,930
1946	2,915	2,547	5,462	40*	0	5,502*

*Estimates

repatriations, if any, are not available. A Military Government census dated April 30, 1946, showing 2,981 males, 2,681 females and 5,662 total population is perhaps best disregarded since it was the first census conducted by natives under American supervision.

There is some evidence that there may have been recent reversals in the trend of gradual increase of native population, although this does not appear in table 8. In table 6 the two youngest age classes are smaller in number than the third, whereas they should be larger. Since the Japanese are said to reckon the age of a child as one year on the day it is born and as two years at the beginning of the next calendar year, the first age class may contain only those born in a four-year period (1937-1940), whereas the second age class (1932-1936) and all subsequent ones should cover five-year periods. This might account for the first age class, but it does not explain the small size of the second (1932-1936). Unless there was an epidemic that wiped out a hundred or more young children, there may have been a reduction in birth rate.

The Chamorro population of Ponape has never been large. Its history, which began only in 1927, can be followed by comparing the available figures for Ponape Island and the Ponape Branch Bureau in table 9.

The nonnative population of Ponape has shown the most marked fluctuations. Throughout the Spanish and German periods it is unlikely that the number of Europeans and Asians on Ponape ever reached fifty. At the time of the "Sokȫs rebellion," in 1912, there were only seven German government officials on Ponape, of whom four were killed, and for a considerable part of their administration the official staff consisted of the Governor, his secretary, a doctor, an engineer in charge of roads and public works, and the chief of police. The German police force was largely recruited from New Guinea and the Experimental Station was run by a Chinese. The Spanish military force was recruited in the Philippines.

TABLE 9

Chamorro Population, Ponape Island and Branch Bureau

Year	Island	Bureau
Before 1926	--	0
1927	--	9
1928	--	14
1929	--	40
1930	--	74
1931	--	60
1932	45	--
1933	50	--
1934	49	--
1935	51	51
1936	97	97
1937	96	--
1938	81	--
1939	110	--
1940	87	92

From 1914 to 1922 the Japanese population consisted primarily of a naval garrison, which was withdrawn in March 1922 under the terms of the Mandate. The civilian community, which numbered less than 150 in 1923, grew slowly but steadily until there were between 650 and 700 in 1930 (see table 11). About 1927 the effects of the Japanese program of colonization first began to be felt, but only to a limited degree because the main efforts during this period were directed at Palau and Truk.

From 1930 through 1938 the Japanese population grew rapidly, reaching a total of 4,061. Immigration was stimulated in 1930, when the emphasis was still on islands to the west, by the opening of the Nambo

copra plantation in Matälanim District. A slight leveling off of population increase in 1933 was more than overcome by the opening of the Kohatsu plantation in 1934, also in Matälanim. From 1934 on the full effects of the Japanese policy of systematic subsidized colonization became clearly evident.

The rate of growth of the Japanese population increased still further after 1938, reflecting the outbreak of hostilities between Japan and China (1937) and Japan's wider military aims. During this period military personnel predominated, but colonists continued to arrive until shipping was completely cut off by American submarine warfare. When Ponape was surrendered to the Americans, the Ponapeans were outnumbered by the Japanese by nearly two and a half to one.

The trends in Japanese and native populations on Ponape Island can be seen graphically in figure 1, a chart based on the figures in tables 7, 8, and 11; dotted lines are used to cover periods for which figures are not available annually. The average annual growth of the Japanese population was 76 from 1923 to 1930, 247 from 1930 to 1933, 530 from 1933 to 1938, and 2,000 from 1938 to 1943 when shipping was cut off.

The census of Ponape given in table 10 below, which excludes the American occupying force, was prepared for Military Government by the Japanese as of September 15, 1945, the date of surrender.

By the end of December 1945, all Japanese had been evacuated from Ponape, although native wives and numerous half-caste children were left behind.

Of the Japanese in the Ponape Branch Bureau in 1937, one third were from Okinawa. Another third were from the six prefectures of Fukushima, Tokyo, Hokkaido, Kagoshima, Hiroshima, and Shizuoka. The remaining third came from other prefectures of Japan proper except for 42 from Chosen (Korea) and 10 from Karafuto (Sakhalin). Figures for the Koreans on Ponape Island show 5 in 1932, 4 in 1933, 13 in 1934, 20 in 1935, 18 in 1936, 42 in 1937, 42 in 1938, 411 in 1939, and 778 in 1940.

More than 95 per cent of the Japanese population, between 70 and 90 per cent of the small European population, and between 60 and 65 per cent of the native population of the entire Branch Bureau were on Ponape Island. The available figures for the Ponape Branch Bureau are given in table 11.

The native populations of the various islands within the Ponape Branch Bureau, based on Japanese figures for 1920-1940, and those recorded by Military Government, are given in table 12. The population of Ant Island is included in the Japanese figures for Ponape under Kiti District; there were 79 in 1930 and 110 in 1935, whereas the number in June 1946 was estimated at about 30. Ant was owned by the Nänipëi Company and Pakin by the Nambo Company and the only residents of these two small atolls were employees of these companies.

TABLE 10

Population of Ponape Island, 1945

	Japanese-Okinawan	Korean	Other	Total
Army	5,805	---	---	5,805
Navy	2,004	177	---	2,181
Civilian	5,679	401	5,864	11,944
Total	13,488	578	5,864	19,930

TABLE 11

Population of Ponape Branch Bureau

Year	Japanese	Foreign	Native	Total
1920	425	6	6,638	7,069
1921	---	--	-----	-----
1922	---	--	-----	-----
1923	146	12	7,614	7,772
1924	188	9	7,806	8,003
1925	357	12	7,599	7,968
1926	302	12	7,739	8,053
1927	418	17	7,753	8,188
1928	549	19	7,895	8,463
1929	608	29	7,914	8,551
1930	689	20	8,201	8,901
1931	995	26	8,323	9,344
1932	---	--	-----	-----
1933	1,441	--	8,448	-----
1934	---	--	-----	-----
1935	2,486	28	8,953	11,467
1936	3,017	31	8,798	11,846
1937	---	--	-----	-----
1938	---	--	-----	-----
1939	---	--	-----	-----
1940	8,048	28	9,584	17,660

The commonest diseases on Ponape are worms and intestinal parasites, yaws, and gonorrhea, each of which affects from about 80 to 90 per cent of the population. The commonest causes of death are tuberculosis and influenza. For the Ponape Branch Bureau in 1930, 114 out of 186 native deaths investigated were ascribed to diseases of the respiratory system; the next commonest causes of death were infectious diseases, with twenty-one cases, and diseases of the digestive system, with eighteen.

NATIVE AND JAPANESE POPULATION ON PONAPE ISLAND

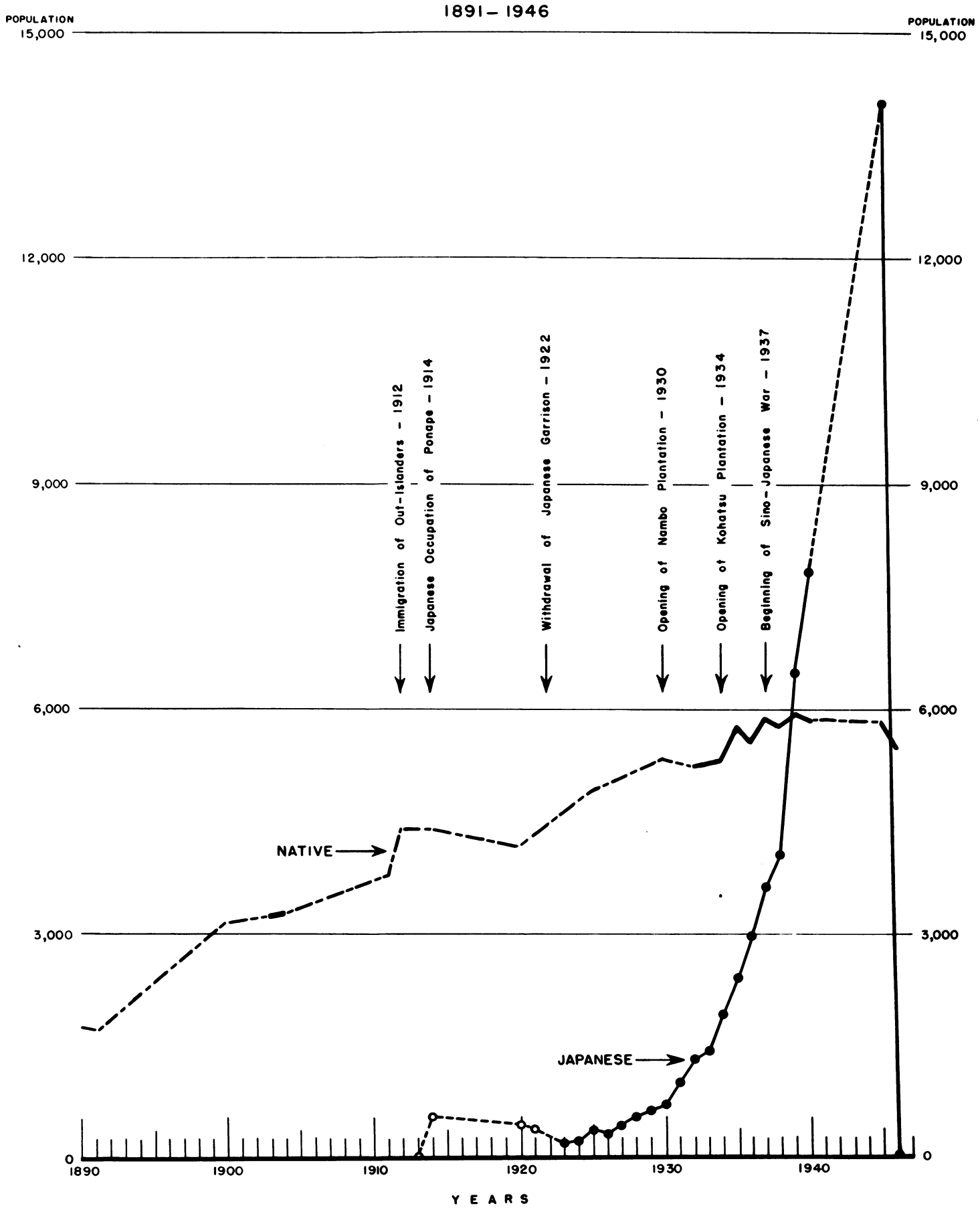

Figure 1

TABLE 12

Native Populations of Islands within the Ponape Branch Bureau

Island	1920	1925	1930	1935	1940	1946	Date of M. G. census
Ponape	4,165	4,915	5,320	5,754	5,866	5,462	June, 1946
Pakin	0	0	0	4	-----	0	June, 1946
Oroluk	0	0	0	4	-----	-----	
Ngatik	273	281	278	295	-----	349	Feb., 1946
Nukuoro	159	184	168	191	-----	235	Feb., 1946
Kapingimarangi	300	341	378	396	-----	(441)	1945
Mokil	246	236	269	258	-----	428	Feb., 1946
Pingelap	601	601	638	694	-----	639	Feb., 1946
Kusaie	786	886	990	1,189	1,605	1,564	Feb., 1946
Ujelang	---	20	11	40	-----	-----	-----
Eniwetok	104	96	108	81	-----	128	-----
Enjabi	---	---	41	47	-----	0	-----
Bureau total	6,638	7,599	8,201	8,953	9,584	9,246	

2. HISTORICAL AND CULTURAL BACKGROUNDS

REVIEW OF THE HISTORY OF PONAPE

The island of Ponape remained out of touch with the rest of the world until the first half of the nineteenth century, although it was probably discovered in 1595 by Quiros, who visited Ngatik and Pakin, and it may possibly have been sighted by Saavedra, who sailed from Truk to Kusaie in 1529. O'Connell, who was shipwrecked on Ponape, remained on the island from 1826 to 1833. Ponape was visited by Lutke in 1828, by Evans and White in 1832, and by Pulchard, who spent a year on the island in about 1835. After 1835 whaling vessels from New England ports, particularly New Bedford, Massachusetts, began to call at Ponape frequently for food, water, and minor repairs. Whaling reached its peak in the Eastern Carolines in the 1850's, declined during the 1860's, and disappeared shortly thereafter because it was no longer profitable in that part of the Pacific. During the Civil War several of the whaling ships were burned at anchor at Ponape by the Confederate cruiser "Shenandoah."

In 1852 American Protestant missionaries arrived on Ponape after an exploratory visit several years earlier. They represented the Boston Mission (American Board of Commissioners for Foreign Missions), a Congregationalist organization that had already Christianized Hawaii. American missionaries had been preceded by a French Catholic priest who had died on Ponape a few years after his arrival in 1838. The French priest was not replaced, but the American mission expanded rapidly and dominated the island until the beginning of the Spanish administration.

In the middle 1860's German trading vessels began to visit the Eastern Carolines to buy copra. Shortly after 1870 three German firms established trading stations on Ponape: Capelle and Company, Godeffroy and Sons, and Hernsheim and Company. Godeffroy sold out to Hernsheim in the early 1880's, but a new German firm had established a station on Ponape by 1883. The three companies, which handled three-fourths of the copra production from the Eastern Carolines in 1885, were amalgamated in 1887 to form the Jaluit Company.

On July 27, 1886 the Spanish flag was raised on Ponape when two warships called to claim the island. It was not until April 19, 1887 that Spanish officials, fifty Philippine soldiers, and six Capuchin priests arrived. The work of building the Colony was begun and Ponape became the administrative headquarters for all the Carolines. Competition between Catholic and Protestant missionaries broke out into open warfare between the Ponapeans and the government troops. As a result all American missionaries were expelled in 1890 at the insistence of the Spanish governor and upon the recommendation of the commander of the American corvette sent to investigate the complaints of the American missionaries. Economic life during the Spanish period was dominated entirely by the Jaluit Company, although by 1893 two Japanese firms were operating on Ponape.

In 1899 Ponape, together with the rest of the Carolines and most of the Marianas, was purchased by Germany after Spain had been defeated in the Spanish-American War. Ponape continued to serve as administrative headquarters for the Eastern Carolines. American missionaries were readmitted in 1899, but they retired permanently from Ponape in 1907 when their holdings were transferred to a German Protestant mission. In 1904-05 German Capuchins replaced the Spanish priests. In 1905 two Japanese trading companies were again operating on Ponape after all Japanese firms had been barred in 1901 for selling firearms and liquor to Ponapeans. In 1906 the two Japanese companies amalgamated to form Nambo (Nanyo Boeki Kaisha) which offered increasingly serious competition to German companies until the outbreak of World War I.

In October 1914 Ponape was taken by the Japanese Navy. It was ruled by a military government, with headquarters in Truk, to which a civil administration department under the control of the naval garrison was added in 1918. In 1920 the Carolines became a part of Japan's Class C mandate under the League of Nations, and in 1922 a civilian administration called the South Seas Government (Nanyo Cho) was established with headquarters in Palau. Ponape was the administrative headquarters of the Eastern Carolines and part of the Marshalls. All German traders were interned in 1914 and later evacuated. Other foreign companies were effectively discouraged so that trade was almost exclusively in Japanese hands and until 1935 was completely dominated by Nambo. All German missionaries were also forced to leave in 1914. The Protestants were replaced in 1920 by Japanese Congregationalists of the South Seas Mission (Nanyo Dendo Dan) and the Capuchins by Spanish Jesuits in 1921.

In February 1944 the Colony was burned to the ground by American incendiary bombs and on September 15, 1945 the Japanese on Ponape surrendered to the U. S. S. "Hyman."

These events can be dated by reference to historical documents. For many of the changes in the economy and culture of Ponape, however, there are no published records and it is necessary to rely upon the memory of living informants. Actual dates for most events in nonliterate societies are unobtainable, but the succession of foreign rulers has provided the Ponapeans with a system of dating that is adequate for historical analysis. In discussing cultural change the Ponapeans use the following chronology: Native period, before 1826; Pre-Spanish period, 1826-1886; Spanish period, 1886-1899; German period, 1899-1914; Japanese period, 1914-1945; American period, after 1945.

The year in which O'Connell was shipwrecked has been chosen somewhat arbitrarily to date the end of the "native period" which lasted until effective contact with the outside world was first established. Within the Japanese period two events prove useful for dating purposes: July 7, 1937, which marked the beginning of Japanese aggression against China—or what is known on Ponape as the "China war"; and February 10-22, 1944, the date on which the Colony was burned to the ground by American bombers. It is to one or the other of these two events, and not to Pearl Harbor, that Ponapeans refer as the "beginning of the war."

The Ponapeans have reacted in different ways to the foreigners with whom they have had contact. In the pre-Spanish period the American influence dominated, but the whalers and the missionaries represented two very different types and Ponapeans learned early not to expect all Americans to be the same. The first contacts with the whalers were not pleasant. In bartering for food the natives were not always treated fairly or kindly and the whalers enjoyed their time ashore with native women after months of rigorous life at sea. This did not accord with Ponapean patterns of morality and sometimes women and even chief's wives were kidnapped and raped. Several ships were attacked in retaliation and destroyed with their crews, with the result that whaling vessels stopped calling at Ponape for several years. After hostilities ceased, some time in the 1840's, relations were resumed on a more cordial basis and a flourishing commerce sprang up, as a result of which a number of new tastes were acquired. Breadfruit, coconuts, yams, pigs, and chickens were bartered for iron implements, European food and clothing, trinkets, tobacco, liquor, firearms, and ammunition.

In contrast to the whalers, the American missionaries represented a strict Puritan element and preached the evils of Ponapean clothing, religion, polygamy, sexual laxity, alcohol, tobacco, kava drinking, tatooing, painting the body with turmeric, and any form of activity on the Sabbath. Their presence was resented by the traders and whalers, who tried to blame them for the smallpox epidemic that broke out almost immediately after their arrival. The success of Dr. Gulick's vaccinations soon overcame the suspicions of the Ponapeans. Through the teaching of crafts and domestic skills and through the introduction of new varieties of useful plants, the American missionaries won the increasing confidence of the Ponapeans. The missionaries accorded special attention to the chiefs who, after being converted, abolished native religious practices in their entire districts. The American missionaries have had a lasting effect on Ponape. The old people, even those who smoke and drink, still remember them with affection and are firm in their conviction that they were working for the good of Ponape.

The Spanish period was marked by Catholic-Protestant rivalry and by outbreaks of violence. Five days after their arrival, the Spanish priests established a Catholic mission in the Protestant stronghold of Kiti District, which led to bickerings between the Spanish and American missionaries. The government seized American mission property in the Colony as the site for the administrative settlement. When, as head of the mission, Mr. Doane protested he was deported to Manila on June 16, 1887.

On July 1, 1887, less than three months after the arrival of the Spaniards, the people of Nęt and Sokȫs massacred a detachment of soldiers to all but the last man. They captured the Colony and slaughtered some seventy of its defenders, including the Spanish governor. The causes of this attack have been variously explained. According to one account it was in retaliation for Mr. Doane's deportation. According to another the soldiers had been sent out to round up Ponapeans who had deserted the Colony in a body because native construction laborers had not been paid, following the embezzlement of the payroll by a Spanish overseer. After the massacre the Ponapeans approached the Catholic fathers and the Spanish commander and asked forgiveness. Until Spanish replacements arrived, four months later, they supplied the survivors of the Spanish garrison with food and water.

The new governor declared a general amnesty, apparently through the intercession of the Catholic fathers, and Nęt and Sokȫs districts were converted en masse from Protestantism to Catholicism. Mr. Doane, whose release had been secured through diplomatic pressure, returned with the new Governor. Two years of peace followed during which the Spanish built and fortified the Colony, began roads to the remaining Protestant districts of Kiti, Matälanim, and Ü, and established Catholic missions alongside the Protestant mission headquarters.

In 1890 an outbreak occurred in Matälanim District which took more than five months to put down. Again the causes are obscure. According to one account fifty-four soldiers engaged in road building at Öa were massacred, presumably for ill-treating native laborers. According to another, thirty-three soldiers were killed when the Spanish garrison was attacked because a native Protestant preacher, who had protested Catholic encroachments into his territory, had been jailed. A column of government troops sent overland from the Colony was defeated and turned back. The Spanish then bombarded and stormed Matälanim harbor and Öa from the sea with "severe loss." Two months later they put an end to the open warfare by capturing a stockade in Kitam Section with the loss of a third of their attacking force. Occasional skirmishes and assassinations of soldiers continued until 1894. An unconfirmed massacre is reported by Christian to have occurred in 1898 when Henry Näpipëi was imprisoned. Peace was not fully restored until the Spanish withdrew from Ponape.

In spite of this record of violence, the Spanish have left little impression in the minds of Ponapeans today. Aside from sponsoring the spread of Catholicism, the Spanish government had no colonial policy or program and did not interfere in local affairs. The power of the chiefs was not restricted or modified. Today the Spanish period is regarded as the final phase of the era of native rule and is remembered mainly as a period in which Ponapean institutions were allowed to continue unchanged.

Peace, which was restored by the Germans, lasted until October 18, 1910, when the German Governor, his Secretary, the Chief Surveyor, and an overseer were killed. The three surviving government officials and the German traders were besieged in the Colony for two months behind barricades until help arrived from New Guinea. This outbreak did not end until another two months had passed.

The outbreaks of violence that have marked the Ponapeans' contacts with foreigners seem to have followed the pattern of clan vengeance. Clan feuds, which might begin when a man's wife ran away with another man, were bloody and frequently ended in fatalities. An abandoned husband lost face in his community and could erase his shame only by beating up his rival. The rival's former wife might also lead an attack against the runaway woman. Each of these individuals would be supported by members of his clan, so that four clans might be fighting at the same time. If peacemakers were accidentally injured by clubs or flying stones when they were trying to interfere, their clans might join the fracas. If the fighting ended with the wounding of the rival or a member of his clan, the injured person lost face and would feel compelled to organize a retaliatory attack to wipe out his disgrace. The clan was allowed by society to act as an instrument of justice. It was responsible for the punish-

ment of those who killed, injured, or publicly disgraced one of its members. Clan wars were permitted to continue until the chiefs decided that the ends of justice had been achieved by the punishment of the guilty, when they were stopped by the order of the District Chief.

The outbreaks against foreigners seem to have been clan actions in avenging specific injustices, injuries, or threats to the safety of a clan member. In the Spanish period there was a background of Protestant-Catholic rivalry, and in the German period changes were made in land tenure and taxation, but in each outbreak a specific incident is apparent. The uprisings do not seem to have resulted from any general dissatisfaction with broad policies, as is indicated by the limited nature of the opposition groups. There have been no island-wide uprisings against foreign rulers, and the danger that they might occur has been exaggerated. In spite of what seems to have been an attitude of disapproval of the Japanese and in spite of incidents that probably justified retaliation, there were no outbreaks in the Japanese period. The interpretation of the early attacks on the whalers and the Spanish as following patterns of clan vengeance must in part be assumed, since historical accounts are inadequate and contradictory. In the outbreak in the German period, however, where details are remembered by the Ponapeans today, this explanation is quite clear.

The war began when the German overseer of a road gang had a Ponapean of the Kawäth clan beaten with a wire-lined rubber hose for laziness or insolence, or perhaps both. In protest, the road gang did not return to work on the following day and the overseer and the chief surveyor set out to round them up. When these two appeared on Sokȫs Island at the home of the man who had been beaten, it was assumed that they had come to give him further punishment. His clan members, according to the pattern, came to his rescue and the fighting broke out. Four German officials were dead before the day ended.

When the remaining Germans barricaded themselves in the Colony, a large number of Ponapeans from other clans and other districts gathered to defend them. Members of the Kawäth clan from other districts came to help their people in Sokȫs, and the siege was laid. Also a number of people from Sokȫs District who were of different clans were rallied temporarily to the fight by Sȫumathọn Sokȫs, the war leader and most influential chief of the district at the time, who was himself a member of the Kawäth clan. For a while during the siege of the Colony the war assumed more the aspect of a district uprising and less that of clan warfare, but during this period there was little actual fighting.

When reinforcements arrived from New Guinea the siege was broken and the island of Sokȫs was captured with the help of fire from the warships "Emden" and "Nürnberg" and the cruiser "Cormorant." Members of the Kawäth clan escaped through the German machine-gun blockade to Nẹt District to make their final organized stand in Nänkawäth, the legendary home and place of origin of the Kawäth clan. Driven from this stronghold, they hid in the mountains until the German troops were called back to the Colony, and then they came in voluntarily to surrender. Seventeen were executed and 426 were exiled to Palau, until they were later repatriated by the Japanese.

The "Sokȫs rebellion" as it has been called could be much more accurately described as "Kawäth clan revenge." Ponapeans today say that it was neither a district uprising nor a rebellion against the German government or German colonial policies. It has generally been interpreted by historians as a native uprising in protest against modifications of land tenure or of the regulations affecting taxation and district labor, but both these changes were widely approved. Ponapeans explain the outbreak as the result of the cruelty and wickedness of two men: the German overseer whose acts were immediately responsible and Governor Boeder who was shot with his Secretary when he showed up on Sokȫs Island. Ponapeans were told by the German doctor that Boeder was mentally unbalanced and that he had killed many natives in Africa, where he had spent twenty-five years before coming to Ponape. They say that he used to question Ponapeans at a trial with a drawn revolver pointed at them, which he shot off in their face to frighten them. When he traveled about the island he flew into a rage if he stumbled on a stone or a coconut, threatening to beat his guides and carriers for not having removed it from the path.

In spite of the war and the execution and deportation that followed, the Ponapeans today feel warmly toward the Germans. Many resented the proud attitude of the people of Sokȫs, who they felt got much what they deserved. The Ponapeans distinguish between good and bad Germans as they do between Americans. The German doctor, Boeder's predecessor Governor Hahl, and his successor Governor Kersting were all very popular. As individuals the Germans were generally liked and respected because they were courteous, neat and well dressed, and versatile in their accomplishments. They always took off their hats to Ponapean women; they always appeared in full uniform in public; and they were able to build a road, run a boat, make a speech, grow copra, or repair an engine with equal proficiency.

The two groups that the older Ponapeans feel were working for the good of Ponape are the Germans and the American missionaries. In particular Governor Kersting is given credit for the introduction of a number of new crops including rubber, kapok, and cotton, for having "divided the land" among the people, and for having laid the foundation of the copra industry on its present scale. Governor Hahl is given credit for giving the Ponapeans better milk cattle. For all these things the Ponapeans today are grateful. In addition the Germans established the Experimental Station and improved the roads. The roads in the outlying districts stand as they were built by the Germans more than thirty years ago. It is said that the German government planned to make Ponape the show place of the Pacific and there is reason to believe that they might have succeeded if they had stayed in power. The Germans gave Ponape a paternalistic but enlightened administration which compared very favorably with that of colonies in other parts of the world.

The attitudes toward the Japanese are mixed and difficult to evaluate. There are some Ponapeans who prospered and held good positions during their administration and who identified themselves and their future with the Japanese. The children were certainly influenced through compulsory education, in which almost half the time during the first three years was devoted to the study of the Japanese language. Particularly among the younger people there were many who until the war approved of the Japanese administration.

At the same time, many seemed to have felt that in some ways the Japanese were beneath them. They ate many foods that the people of Ponape consider unfit

for human consumption—snails and toads are only two commonly cited as examples. They also ate many forms of local sea food which the Ponapeans refuse to eat. One of the questions asked in the attempt to find whether the two hundred odd kinds of fish and sea food recorded were edible never failed to bring forth laughter and became a standard joke; it was "Did the Japanese eat it?" The Japanese ate everything that was not poisonous.

According to the standards by which the Ponapeans judged the Germans and which they also apply to themselves, the Japanese did not do very well. They were regarded as lacking in ability because their skills were specialized; they did not always observe the forms of courtesy; and they were not always fully dressed. In the Japanese period, even Ponapean women began to go about the street unclothed above the waist, whereas the Germans had encouraged western standards of decency and women had always covered their breasts at the approach of a stranger. This and the taking of Ponapean girls as mistresses shocked the older people in particular. As the Japanese colony on Ponape expanded, and especially after the arrival of the military garrison, increasing numbers of girls were forced into domestic service and as a matter of course became mistresses of the Japanese men, resulting in the large numbers of Japanese half-castes found on Ponape today. The Ponapeans had been accustomed to Ponapean prostitutes since the time of the whalers, but previously they had been able to regard them as a special class of individuals. This was something different.

After about 1941 or 1942, liquor was sold freely to Ponapeans in Japanese stores on permits issued by the government office. Provided with a permit for one or two bottles, a Ponapean could buy as much as he wished. Drinking, at least among the older people, was confined to those who had acquired the taste through contact with the whalers, and the "Christians" still refused to drink. This relaxation of the mandate restrictions does not seem to have aroused any dissatisfaction. In contrast, kava drinking was restricted to no oftener than once a week, until the time of the American air raids, not because of any harmful effects but because it might "make the drinker indolent." Although informants remembered no German attempts to prohibit or curb the use of kava, the Japanese asserted that their restrictions simply followed a precedent set by the German administration.

The German rules of land tenure were markedly modified under the Japanese. Unoccupied land that had been free for all to use under both the Ponapean and the German systems of land tenure were declared the property of the Japanese government, presumably after the withdrawal from the League of Nations. Mountain farming and the growing of Cyrtosperma in fresh-water marshes were abandoned. Restrictions on the sale of Ponapean landholdings were removed. With the increasing Japanese population in the late 'thirties and the government demands for land for military purposes, there were encroachments on the lands owned by Ponapeans that could not be recovered since Ponapeans could neither establish new farmsteads as before nor purchase government land.

With the beginning of the positive, government-subsidized program of colonization, it became evident that native welfare was being sacrificed in the new program of developing the island for Japanese nationals. This was a marked change from the German policy which had made no attempt at colonization and whose innovations had been primarily for Ponapean benefit, although German trading interests might benefit at the same time. Whereas the Germans experimented with the introduction of new plants that might be grown for export by the Ponapeans, the Experimental Station under the Japanese seems to have confined its work exclusively to crops for consumption by the local Japanese community or those that would be grown on Japanese-owned plantations.

With compulsory teaching of Japanese, the beginnings of alienation of Ponapean land, and a rapidly expanding Japanese population, Ponape was moving in the direction of Saipan when the war broke out. Some Japanese were talking of making Ponape a thoroughly Japanese island, and the moving of the entire native population to Kusaie was even mentioned. Whether or not these suggestions would have become official policy, there can be little doubt that had the prewar trend continued for another generation or two, the Ponapeans would have lost their land and their culture and would have disappeared as a people as a result of interbreeding and intermarriage.

This trend, which seems apparent to an outsider, was only vaguely seen by some of the Ponapeans, but nevertheless was clearly enough understood to cause uneasiness among some of the older people. When the war broke out and the military garrison arrived, their new position, if not their future, became apparent to increasing numbers.

Men and women were recruited for forced labor on military installations and on agricultural projects for local subsistence. Regardless of traditional patterns of sex division of labor, men and women worked side by side in growing cassava, sweet potatoes, paper pulp, and wet rice, of which the last was regarded as particularly unpleasant work. Nearly all able-bodied men and women were taken from their farms, and native production of both subsistence and export crops was neglected. Copra exports fell off until they were finally stopped by the submarine blockade on shipping. The Ponapeans ate in Japanese restaurants and field kitchens, unable to plant yams or harvest their breadfruit.

Numerous thefts and apparently wanton destruction of native property occurred, which further alienated the people. Some houses were invaded and floors, walls, and furniture torn up and carried away for firewood. Clothing and dishes were appropriated, with the result that many Ponapeans buried their imported china in the ground until the war had ended. Some 40,000 coconut palms were destroyed, many without compensation. At least once, a kava stone was broken up to build a stone cookhouse for a military camp. These stones are highly prized and difficult to obtain; they are five feet or more in diameter and about five inches thick, and are chosen particularly for their bell-like sound made when they are pounded in making kava.

Most of these excesses were perpetrated by the military, but when the Ponapeans went to civilian authorities to protest against them or to try to prevent their thirteen- and fourteen-year-old daughters being taken away as domestic servants and mistresses, they were given no satisfaction. And they soon learned that complaints to the military authorities got them nothing except beatings. All district feast houses were ordered destroyed by the Japanese. If this was done as a precaution against air raids or invasion, no explanation was made. The Ponapeans came to expect orders from the Japanese with no reasons given, and after thirty

years under Japanese rule they have learned to obey orders from their rulers without questioning them or offering suggestions or criticisms.

On the other hand, the Ponapeans experienced their greatest period of economic prosperity under the Japanese just before Pearl Harbor. New exports in fibers and drugs were developed. These new industries may have grown out of Japan's wartime needs rather than from any desire to benefit the Ponapeans, but the result in any case was a two-to-three-fold increase in native income from exports between 1936 and 1940, with exports still expanding. In this same period Ponapean income from wage labor also increased several fold and the Japanese stores carried an increasing variety of imported goods. There can be little doubt that, regardless of official intentions, the Ponapeans' material well-being was greater under the Japanese than under the Germans. Although personal freedom was severely curtailed by the program of forced labor, the Ponapeans enjoyed their highest standard of living just before the war, especially between 1939 and 1942.

Because their complaints against the Japanese are so frequently volunteered, both by the young and the old, one suspects that the Ponapeans have learned that this technique wins American sympathy and friendship. Nevertheless, particularly because of Japanese behavior during the war period, there is less loyalty and devotion to the Japanese than one might have expected from their long period of rule and the compulsory education in Japanese. Certainly the Americans did not encounter a situation comparable to that on Palau where the period of Japanese administration represented the "golden years" of its history.

Upon arrival the U. S. Navy found a situation that was favorable from many points of view. Disillusionment if not actual hostility toward the Japanese had set in; Americans were remembered with warm feelings from the missionaries in the pre-Spanish period; and American goods were known for their good quality. Under the Japanese, ample supplies of imported goods had been available at low prices, but these were recognized as lacking in durability, and furthermore they had disappeared during the latter part of the war. The Ponapean economy had been disrupted by the blockade on shipping and the forced labor on Japanese projects. Even education was neglected because of the war. A rapid return to prewar economic conditions by itself could have won the United States lasting gratitude.

A full year passed, however, without any marked recovery having been effected. Clothing and urgently needed imported goods did not arrive in anything like adequate quantities until after nine months. Some women had no clothing at all and had to hide in the farms unless they could borrow the dress of a woman who was willing to stay home. For months at a time no goods whatever were on sale. During the first year of American occupation no copra was purchased and all that most people had to live on was the money they received in exchange for Japanese yen. Ponapeans received only 22 per cent of the value of the yen they surrendered and their per capita wealth on April 30, 1946 was $4.03. The neglect of copra in favor of feasting, growing yams, and growing subsistence crops was in part a reaction to the forced labor under the Japanese, but it was also the result of the self-evident need to provide food for themselves and of a widespread uncertainty as to whether Americans would actually purchase copra.

When the Americans first arrived, the Ponapeans were told by the Executive Officer that they had been "liberated" by the Americans and were now free to do as they wished. Later they were to learn that this was not meant in the sense that they understood it. They expected to move into the Colony and rebuild the city there, but approval for rebuilding this area was not granted. They expected to be able to take over land that had been purchased or taken from them by the Japanese, but were told that this was property of the American government and that, although they might obtain permission to use it temporarily, no promises could be made as to their rights to keep it. Some interpreted the ringing phrases about freedom as meaning that they had no more obligations to their chiefs, and the question of the future position of the chiefs was aggravated unnecessarily. Most Ponapeans, however, interpreted these phrases as a blessing upon a return to feasting and kava drinking or whatever they wished to do. These speeches were a retarding influence on the re-establishment of the copra industry and eventual economic recovery which cannot be overlooked.

The Ponapeans' attitude toward Americans was characterized by exceptional tolerance and patience. In the face of shortages that would have caused violent protests in any American community, they withheld judgment, making allowance for wartime conditions and contenting themselves with waiting to see what would happen in the future. Americans had nothing to be proud of during the first year of occupation except the Navy hospital and honorable intentions, although the Ponapeans found something to be grateful for in being allowed to return to their own farms.

The original occupying force was busy with establishing a base of operations, disposing of Japanese ammunition, collecting Japanese yen, and evacuating the Japanese military and civilian personnel. There was little time for concern with native problems. When these tasks were completed the base was reduced to a size which, because of inadequate shipping and the type of personnel, had all it could do to maintain itself and its own installations. Japanese equipment rusted and disappeared and the jungle was closing in, while almost the entire effort was devoted to keeping the generators, the reefers, the vehicles, the radio station, the telephones, and the camp water supply operating as well as possible. By comparison with the Japanese garrison, the force of forty-odd Americans was totally inadequate in numbers, but by comparison with what the five or six German officials had accomplished, there should have been a lot more to show for the first year of American rule. It was not until ten months had passed that personnel capable of tackling the functions of Military Government on Ponape arrived.

The situation on the outlying islands, where no one was stationed, was even worse. In February 1946 Japanese yen were collected from Mokil and Pingelap, but a return visit to distribute American dollars was impossible because of the lack of shipping. These two islands were left without a medium of exchange and reduced to barter, until the chief of Mokil and some of his people came ninety miles to Ponape in a twenty-foot native-made whaleboat with mat sails, arriving in time for the Fourth of July celebration. When they returned, they carried back dollars and trade goods to Mokil, but the responsible Military Government and medical officers were unable to visit the outlying islands again during the first year of occupation.

In personal matters, American enlisted men fell short of the standards by which Ponapeans judged them,

although the officers on the whole were liked and respected. Enlisted men appeared at work and in the movies without shirts, and repeated drunkenness and obscenities in the presence of Ponapean women caused comment and criticism in the native community. Their promiscuity was confined largely to women from outlying islands, who are apparently more broad-minded in such matters than the Ponapeans, and the latter fortunately knew little of what was going on. Still there was talk about the men from the occupying force who, it is said, broke open cases of the first U.S.C.C. trade goods unloaded on Ponape and thrust them in the arms of the native laborers, telling them to bring them women that night. In a later incident, the Ngatik people themselves turned in one of their own men who helped an enlisted man steal some U.S.C.C. goods for his mistress. Fortunately the Ponapeans have not judged all Americans by some whom they met during the first year of occupation. Since they have been willing to reserve judgment about American rule there is still time to show them that we intend and are able to benefit them.

PONAPEAN PERSONALITY

As their history indicates, the Ponapeans are generally a patient, tolerant, but not uncritical people, who are not apt to resort to violence except in response to specific grievances. For more than thirty-five years there have been no clan wars and no retaliatory attacks on foreigners. The frequency of these outbreaks in the early period is indicative of the Ponapean's sense of independence and pride and of the number of injustices suffered, rather than of any instability in character. The early record of aggression is not matched by aggressiveness in everyday behavior. Ponapeans are extremely quiet, self-possessed, retiring, and, unless they are called upon to participate, aloof. Aggressiveness in any of its forms is inhibited and concealed. The out-islanders from Ngatik, Pingelap, Palau, Yap, the Mortlocks, and other parts of the Carolines—all of whom seem reserved by American standards of behavior—are aggressive in contrast to the Ponapeans. The out-islanders come to the Navy and U.S.C.C. offices seeking employment whereas Ponapeans, even when they are interested, wait to be invited to come to see about a job. The out-islanders will state their qualifications for a job, but Ponapeans regard it as a form of bragging to admit that one is a carpenter or a mechanic.

This reluctance to seek work and to state qualifications for a job are a part of a much larger pattern of modesty and sensitivity to criticism and ridicule that is an important aspect of the Ponapean personality. There are few situations in which a Ponapean can openly show pride in his accomplishments or his possessions without fear of criticism for pretentiousness, boasting, or "acting big" (äkilapalap). Fear of ridicule or of unfavorable comment and gossip is sufficiently strong to enforce what seems to the outsider to be a pattern of exaggerated modesty and humility.

Although wealth is one of the sources of prestige, property can be divided into three classes on the basis of the extent to which it can be talked about. Two forms of property, money and coconut trees on which a new form of social achievement is based, can be mentioned publicly without criticism. If someone mentions that another person has 500 yen or 500 coconut trees, a man may say "I have 600" without fear of criticism. He is acting proud (äkilapalap) but in this case it is nothing to be ashamed of. At the other extreme are yams, pit breadfruit, and kava, which enter into the older formalized prestige competition. Every possible attempt is made to conceal the amounts of these that are owned. A man will lie about their number or deny that there are any, if necessary.

Most possessions, however, fall into an intermediate status; they are displayed openly for all to see, but their quality, workmanship, and value are deprecated. If they are mentioned by the owner it is always to apologize for them or to contradict any complimentary remarks made about them by others. Invariably when a guest enters a Ponapean home, the owner apologizes because it is small and old, regardless of its size or age. Invariably when meals are served some apology is given: "This is all we have to eat on Ponape; we cannot buy things in the store as we used to" or "We would like to make you a cake or a pie the way the American missionaries taught us, but we can't get any flour or sugar," or "Please excuse the dishes. We used to have good ones, but the Japanese destroyed them all." And invariably when a gift is given, a Ponapean explains that it is of little value or poorly made, but that it is the best he knows how to do. Whether it is true or necessary by objective standards, an excuse is always given.

A fine house, a good set of china, good furniture, a good canoe or motor boat, nice clothes, books, and in particular sweet-smelling perfumes, bring prestige and praise; but the owner must conceal his pride and protest when compliments are offered. If someone says "My, what a nice house you have," the owner replies "Oh, no, it isn't." If someone says "My, but that is nice perfume you have," the one who wears it replies "It isn't really, but it's the best I have." The best pieces of furniture will be put out in the front room where visitors cannot miss them, but when compliments are given the owner protests that they are undeserved.

At about the age of ten, children are taught that praise may be sweet but that pride and boasting about certain possessions are wrong. It gives a mother pleasure if no one except the family is present when her daughter says "I have a prettier dress than Mary has." A mother is also happy when a third party tells her that her daughter has said to another girl "My dress is prettier than your dress" or "I have more dresses than you do." But if an outsider is present when a mother hears her daughter talking like this, she tells her daughter to be quiet. Similarly a father is pleased if he hears his son say to another boy "My father has the biggest house in the section" or "My father is a better fisherman than your father," so long as he knows that no one else knows he can hear what is being said. If someone else knows he is listening, he stops his son from bragging. Often young boys boast about the number and the kind of yams their fathers have, and since these are secret matters that each man tries to hide this is regarded as extremely humorous. When the father hears what has happened he calls the boy in and tells him he mustn't say such things. On the other hand, no attempt is made to stop children from bragging about their skill in children's games or about their parents' money or coconut trees. Children who do not learn by the time they are fifteen that they must not boast about certain things are beaten by their parents if necessary.

The pattern of modesty carries over to other things than one's own possessions. The praise that a woman likes to hear most is that her husband is industrious and a good provider, or that there is lots of food at a meal, or that her cooking is good, but she must deny such compliments as well as those about her own and her husband's possessions. A mother must protest against praise of her children's beauty or good behavior or intelligence. She may admit that she has a large family when complimented on the number of children she has, but she cannot brag about how many there are.

A chief may admit that his people are kind or clean or generous, but he may not admit that they are skillful or industrious, or that their farms or his section is good. If someone praises a fine feast house, he may accept the praise for his people by saying "Yes, my people are very good to me," but he disagrees if someone comments that the carpenter who built it is very skillful. A chief also denies that he is a noble if he is asked by a Ponapean. He waits until there is a feast when everyone can tell his status from his seating position in the feast house. Sometimes in dealing with Americans this pattern is modified because it is understood that they are outsiders who are not used to the ways of Ponape; but not always. On one occasion an informant denied repeatedly any knowledge of the clan to which he belonged, while all the onlookers snickered. It was not until much later that I found out that he was a member of the ruling clan of the district, and that the snickers were as much because of my ignorance of what was going on as they were at the man's discomfort under the pressure of my repeated questions.

The apparent aloofness of Ponapeans is a part of the same pattern. What may be misinterpreted as a lack of interest is often a reluctance to intrude without an invitation. Ponapeans may wish to participate in some event or activity that is taking place, but hesitate to do so unless asked for fear of being forward, according to their standards. Ponapeans want to become acquainted with Americans, but unlike the Ngatik or Pingelap, for example, they do not take the initiative in cultivating such friendships. This pattern carries over into the field of administration. Although Ponapeans often say, when asked for an expression of opinion on policy, "That is for you to decide," recent decisions and current problems are discussed and evaluated with interest. There was a great deal of criticism of the price schedules established by Military Government, in private, but even the chiefs and district representatives did not suggest to Military Government the corrections that were necessary. The Ponapeans' experience under the Japanese gave them added reason for not making suggestions or criticisms to their rulers. It would be a mistake to assume, because Ponapeans are often reluctant to express themselves, that they are not concerned with what Military Government is doing.

Gossip and ridicule on the one hand and praise and compliments on the other, are powerful instruments for enforcing the accepted codes of behavior on Ponape. Even though its effectiveness may be diminishing, the fear of being talked about with disapproval, and particularly of being laughed at, is still a social force the strength of which is difficult for an American to appreciate. There is a great deal of laughter on Ponape, but little humor that is not malicious. Some jokes, such as those about sex, are impersonal, but usually people laugh at someone rather than at something funny. Clumsiness and ignorance in performing a task as well as deviation from a social norm bring laughter and shame.

Americans who make jokes about a Ponapean's person or clothes or abilities cause discomfort that is no less real because it is unintentional. And in the same way, failure to receive praise and compliments for tasks well done or for possessions of which Ponapeans are proud, whatever they may say to the contrary, brings hurt. Because praise and criticism are such important forces in moulding behavior, the people of Ponape are constantly watching and listening to see which is forthcoming, and they attach great importance to acts or words that Americans regard as having no significance.

Although in this sense they are extremely sensitive to laughter, compliments, and even well-meant corrections and criticisms, their reaction is not easy to observe. Shame as well as pride and satisfaction must be concealed. A man who is being laughed at or criticized tries to correct his mistakes as if he had not heard anything. If he reveals his embarrassment through anger or tears, or through running away, or even by a noticeable change in his expression the result is more laughter, more talk, and more shame.

A deep sense of pride that cannot be expressed openly, a hunger for praise and recognition when it is deserved, a retiring modesty, tolerance and patience, together with a quiet dignity, are dominant characteristics of the Ponapean's personality. The people of Ponape have a character, as well as a history and a set of traditions, that is their own. Americans who come to Ponape from the Marshalls, confident that they already "understand natives" from their previous experience, must either revise their opinions or, as has usually been the case in the past, leave without meeting the Ponapeans on common ground.

3. SOCIAL, POLITICAL, AND ECONOMIC ORGANIZATION

THE FAMILY

The basic social unit of Ponape is the family (pąnäinäi). In what the Ponapeans regard as its true meaning, this term refers only to the members of the immediate family: a man and wife, their children, and their children's children. In this stricter usage, the immediate families of two brothers constitute two separate pąnäinäi. The same term also is used in a broader sense to mean the extended family. Each individual belongs to two extended families, one composed of his own immediate family and the immediate families of his brothers and sisters, and the other composed of his own immediate family and the immediate families of his wife's (or husband's) brothers and sisters. A man's own brothers or sisters are not a part of this second extended family. Except for the highest chiefs, families were monogamous even in the early days.

The immediate family is expected to provide for and take care of itself under normal circumstances, but in times of emergency or when faced by tasks too large to undertake by itself, the clans of the husband and of the wife come to its assistance. With few exceptions, the family itself does not function as a cooperative group in production. Rather, because of the division of labor by sex, the functions of husband and wife are complementary and independent, and property lines within the family are clearly drawn. A man is responsible for planting and harvesting certain crops, such as yams, breadfruit, and coconuts, whereas other crops are regarded as women's work. A wife owns the pineapple, taro, and other plants that she grows, and they are regarded as her private property from the time she plants them until they are actually served at a meal. Roles in fishing, hunting, the gathering of wild food, and animal husbandry are also divided between husband and wife along sex lines.

No property is owned by the family as such, but its members have definite responsibilities to provide for each other's needs. A husband relies upon his wife to provide him with the "grass skirts" which, though they are worn only by men, are made only by women. The skirts are considered "gifts" (kisäkis) from the wife to her husband and are the wife's property until they are actually presented to him. The wife's responsibility in this matter may be compared to an American man's obligation to buy hats for his wife to wear; on Ponape it is the man who may have to keep reminding his wife that he needs a new skirt, while she keeps putting him off, insisting that the old one is still good enough to wear.

At marriage it is customary for the husband to give his wife half the pigs, chickens, and other livestock that he owns. He hesitates to give less than half for fear that people may say he is not generous or to give more because he will lose them if his wife should leave him. The animals and their offspring become the wife's private property to do with as she wishes. She may sell them and use the money for her personal needs, but usually about half the money from the sale of either the wife's or the husband's animals, is presented to the other mate as a "gift." Each brood of chickens or litter of pigs is generally divided in the same way.

Similarly the income from cash crops such as copra is shared by the married couple. The usual pattern is for the husband to set aside enough money to meet household expenses and then to present about half the balance to his wife as a "gift." The wife uses her money for her own personal needs: combs, hair ribbons, lace, cigarettes, perfume, lipstick, twine for her fish nets, church contributions, and the like; and with his money the husband buys cigarettes, towels, twine for his fish nets, and so forth, and pays for his haircuts and makes his own church contributions. Some families regard clothing as a personal expense, but more commonly these are classed as household expenses along with kerosene, matches, salt, flour, biscuits, rice, sugar, tea, canned beef, mirrors, books, dishes, cutlery, furniture, paint, nails, glass, sheet roofing, padlocks, and the like.

When children reach the age of from about thirteen to fifteen and begin to help in copra manufacture and other production, small amounts of money are set aside from the income in their name. This is a matter of budgeting rather than building up a fund to be given to them when they become of age. The money is used to buy the small things that children like or need, and is not replenished until it is exhausted. When they reach the age of about eighteen or twenty children are usually given a piece of their father's land on which to start farming on their own. They usually inherit this land at their father's death and any crops they grow on it are their own private property. Children do not own money or livestock until they are given land and start farming on their own. They do not share in the litters of pigs or broods of chickens divided between husband and wife, and so long as they help their parents in farming, the father or mother owns whatever they produce.

The family is established by marriage, two farms of which are recognized today. "Common marriage" (pwǫupwǫuth mwäl) involves no ceremony and is accomplished by the simple fact of living together. "Real marriage" (pwǫupwǫuth mẽlẹl) involves a feast at which bride and groom exchange the shares of the food they are given to take home and receive gifts from friends, members of their extended families, and clansmen. Usually there is also a church ceremony on the following day, but this is not essential to a "real marriage." "Real marriage" today is an abbreviated form of an older ceremony, in which the bride and groom appeared before the Section Chief on the day following the wedding feast and were annointed with perfumed oil after they had exchanged garlands of flowers. The older ceremoney was directly associated with infant betrothal and disappeared with this institution during the Spanish and German periods.

Through infant betrothal (kisin nïn) the nobility made certain that their children married people of equal rank and commoners were assured that property would remain within a group of close relatives. Today marriages are arranged by the couples themselves with the approval of their parents. Although there is considerably more freedom of choice than formerly, the marriage of a boy to a girl of his father's clan or to his mother's brother's daughter (lsŏ) is still preferred.

Preferred marriages of cross cousins and the tendency toward the pairing of the matrilineal clans in marriage made it possible for inherited property to benefit both a member of the clan of the mother (the son) and a member of the clan of the father (the son's wife), where descent was matrilineal and inheritance patrilineal.

The immediate family includes adopted children (seri en pwekipwek), who are usually the children of close relatives. Adoption is very common on Ponape, particularly among childless couples who wish to have an heir for the husband's property and a son or son-in-law and his relatives to work their land and support them in their old age. Adoption also provides a family for orphans and a heritage for children who, in a large family, would receive at most only a small piece of land.

Divorce was formerly impossible. A husband and wife who had been betrothed in infancy might separate but could not remarry or have sexual relations with other men and women except in secret, even after their mate had died. Both divorce and the remarriage of widows and widowers began only with the disappearance of infant betrothal in the Spanish period, but neither separation nor divorce nor death erase the economic obligations of surviving family members toward each other. Both husband and wife must continue to provide food, clothing, and housing for their children.

THE CLAN AND SUBCLAN

Every Ponapean belongs to one of a number of exogamous matrilineal clans (tipw or sōu) which have economic and ceremonial functions, regulate marriage, and are the basis of hereditary rank. The individual belongs to the clan of his or her mother, so that a father and his children are always of different clans. Twenty-three clans of varying size were recorded, and are shown in the tabulation below.

Tabulation B

1. Tipwiniman tōntōl "Black Bird Clan."
2. Tipwiniman pwetepwet "White Bird Clan."
3. Tipwiniman en Sotō "Sotō Bird Clan" (Sotō is a farmstead in Section K19).
4. Sōun palienpil "Clan of the Other Side of the Water."
5. Sōun Röi "Röi Clan," named after Section K1.
6. Sōun Pwok "Pwok Clan," named after Section K16.
7. Tipwinpänmäi "Clan of Under the Breadfruit Tree."
8. Sōun Maraki "Maraki Clan," named after Marakei Atoll in the Gilberts.
9. Sōun Iap "Yap Clan," named after Yap in the Western Carolines.
10. Sōun Kawäth "Kawäth Clan" named after an abandoned section (Nänkawäth) in Net District.
11. Sōun Samaki "Samaki Clan," named after a hill in Kiti District.
12. Tipwin Lük, Sōun Lük "Lük Clan," named after a Ponapean deity.
13. Tipwinipāpā "Pāpā Clan," meaning unknown.
14. Tipwinipwek "Pwek Clan," meaning unknown.
15. Tipwin Wäi "Foreign Clan."
16. Tipwiniwēi "Wēi Clan," meaning of Wēi in this context is unknown; possibly "Turtle Clan."
17. Tipwilap "Big Clan."
18. Lasïalap "Great Eel" (lasï or kamïsik is a fresh water eel).
19. Pütun Meaning unknown.
20. Lipitan "Pack up and run away" (translation uncertain).
21. Liärkotō "Miss Fleeing to Kusaie."
22. Läthak Meaning unknown.
23. Näniak Meaning unknown.

Accurate figures of clan sizes are not available since clan affiliations have not been recorded in any census. Roughly, however, they apparently vary from about 5 to 500 individuals. According to informants the largest clans are 1, 2, 7, 10, 15, and 17. At the present time 7 is the largest of all, whereas 17 is said to have been the largest in early times, as its name ("Big Clan") indicates. The smallest clans are 9, 14, and 16. Clan 16, said to have existed formerly, may actually be extinct at the present time. All other clans listed are of intermediate size.

Except for Clan 19, which is said to have been found only in Ü District until about twenty years ago when it spread to Net District, the clans are widely distributed and cut across district lines. In Net District all clans are present except 3, 5, 8, 9, 14, and 16, though there are only a few members of 2 and 19. In Ü District, all clans are present except 2, 5, 9, 14, 16, and 21. Some clans are found in every district. In each district the chiefs can be chosen only from specific clans (and certain subclans within them), but the "ruling clans," as these may be called, vary from one district to another.

The clans are totemic in nature. The totem is sometimes regarded as the actual "mother" (nōno, ïn) or totemic ancestor, and sometimes as having come to the assistance of human clan ancestors in the legendary past. In either case the totem is regarded as sacred (sarawi) and cannot be killed or eaten. The totemic taboos are still observed by the majority of Ponapeans, although they are known to have been violated by a number of individuals without ill effects. The totems recorded include a fresh-water eel (kamïsik), shark (pōko), a ray (likanthinikap), a trepang (likäpensēth), centipede (mänirän), a sea turtle (säpwäkē), and chicken (malek). They also include a number of commonly eaten fish (sämwe, ïomō or mwathäl, särа, kōng, mwängar, säwi), which are eliminated from the possible sources of food for the members of the clans concerned.

Each clan is regarded as having been founded by a woman who migrated to Ponape in the distant past, or as having split off from another clan after its arrival. According to tradition the "Bird Clan" (Tipwiniman), which was formerly known as the "Western Clan" (Sōun äir) was descended from a woman (Limwētu) who was the first to settle on Ponape, and who later turned into a bird. In the course of time it split into the present clans 1-6, all of which are believed to be historically related.

Most clans are in turn composed of several subclans (käianak) which trace their descent from different female members of the same clan. The subclans also have distinctive names, though these are less commonly used than clan names and are not widely known. The clans themselves are exogamous, and intermarriage between different subclans of the same clan is prohibited. One notable exception to this is Tipwiniman ïsön Kiti, whose members are permitted to marry into the other subclans of Clan 1. For this reason some

informants regard it as a separate clan rather than a subclan of Clan 1. The members of this clan are called ɪ̈sö (cross cousin) in recognition of the special status which allows them to marry individuals who normally, because of their close relationship, would be taboo.

In actual fact it is difficult to draw a clear distinction between the clan and subclan, because Ponapeans today disagree with one another whether a specific group is actually a tipw (or sȫu), or a käinȧk, or are not clear on the matter in their own mind. In spite of the uncertainties and differences of opinion, the rule of exogamy is still observed. In one rather spectacular case under the Japanese, a marriage between two members of Clan 10 who had previously been living together on Truk was stopped by a mass demonstration in front of the government office. The couple was exiled from the district and forced by continued social pressure to live apart. Before the power to impose a death penalty was denied to the chiefs by the Germans, both offenders would have been put to death with a spear at the order of the District Chief.

Ponapeans are taught as children to love and help clan members who live in the same district. The clan, with its larger numbers and greater resources in manpower and property, comes to the aid of the family in time of need. Clan wars, in which members of one clan sought revenge for the death, injury, or public disgrace of one of their number and the members of another clan rallied in defense, were one form of clan aid. Probably the last clan war, in which no one was killed but four people were severely wounded, occurred in Ü District in the German period, but clans continue to assist their members economically. Economic aid is limited to cases where the need is apparent and the individual family deserving, and in a sense the clan provides a form of social insurance. The clan does not participate in the basic economic functions of farming, fishing, hunting, gathering, or animal husbandry, and there is no sharing of every fishing catch or dividing of all food harvested among clan members as there is in some societies.

When a man is sick and unable to provide for his family both his own clan and his wife's clan bring food and clothing. If a man is arrested, his clan helps to raise the money to put up bail or to pay his fine, unless they feel that he needs a lesson and decide to let him serve a sentence in jail. When a man dies, his widow and children are the specific responsibility of his brothers and his widow's brothers, but other members of both clans share in their support. The children are frequently adopted into the family of their mother's brother, whereas the widow rarely remarries outside her husband's clan and can remarry only with the permission of her husband's brother. An aged widow with no children, no brothers, and no husband's brothers to support her, may be taken into the household of a clan member who provides for her no matter how distant their actual blood relationship may be.

The clan also forms the basis of cooperative work groups to help its members erect a house (ɪ̈mw), build a canoe (wär), make a new seine (ük) for fishing, or make pit breadfruit (mär) on a large scale. When finished these belong to the man for whom they were made. It is unnecessary to ask for help. When a man decides upon any of these undertakings he talks it over with his wife and through her the word spreads. Members of both the husband's and the wife's clan who live in the same district come to volunteer their services and find out the date that has been set. A large group, consisting of the members of the two clans, plus friends and the members of the extended families who may not be clan members, gathers to do the work. The husband and wife help in the work and provide food for the people who have assembled.

One hundred or more men, women, and children may come to help a man build his house. In theory at least, the husband's clan and the wife's clan are each responsible for building a half of the house, and each member of the two clans in the district feels he must contribute something to the house. Since the Spanish period this obligation is sometimes filled by giving money to help pay for the iron roofing instead of bringing sennit or helping with the work itself.

When the old-style houses were built, a man was put in charge of building each of the sections of the house. These sections were about six feet long and consisted of the part on one side of the house between two of the outer house posts. Each of the appointed men headed a small work group, consisting of the members of his family and any other individuals with no assignment who volunteered to help him. These small work groups, whose tasks were further subdivided on the basis of sex, competed with each other for the honor of completing their section first. For this reason, and because of the belief that a man's enemies were using supernatural means to prevent the house from being completed, the groups commonly worked from six in the morning until ten at night and tried to finish the house as quickly as possible.

Pit breadfruit is usually made by the family or the household itself, but when an especially large one is needed the clans of the husband and wife help, the men gathering the breadfruit while the women peel and quarter it. Clan members also help in preparing hibiscus bast and twisting it into the twine used in making the fishing seines; the actual netting is divided into two parts, the owner and his family making one half of the net, and a close relative and his family making the other.

In canoe building the work group is small and consists only of men. Today, this group helps a man only in hollowing out the canoe body and pulling it down to the canoe house where the owner finishes it himself. This initial period is critical because of an insect (tärisikän) which bores holes in the wood if it is allowed to lie in the forest for a week; and until this part of the task is over the men work from morning to sunset, usually reaching home after dark, while the owner cooks food for them and carries it up to them in the mountains. Formerly the members helped also in cutting and tying the outrigger and outrigger attachment, in painting the canoe, and by contributing small skeins of sennit, but this work is now done by the owner. The owner also makes the sail, the masts, the paddles, and the canoe bailer. When a man catches his first fish with a new canoe or a new seine, he gives part of his catch to those who have helped him make it along with the "first fruits" which he presents to the chief. The real return for cooperative work, however, is the fact that when a similar occasion arises for the helpers, they too can count on the assistance of the clan.

All four of these forms of cooperative work are still engaged in by the clans today. The functional unit is not the clan as a whole, but the members of the clan who live in the same district. These are sometimes referred to as one's "family" (panäinäi), instead

of by the more correct term "clan members" (sǫ̈ui), in recognition of this closer association. Clan members in other districts are said to desire to help, but are prevented by the distance which separates them. Some say that in former times when district boundaries were less important, they actually did participate.

The only form of economic assistance received today from clan members of other districts is hospitality when traveling. Unless a person has a close friend or a member of his extended family in a district, he stays with a clan member. He is made welcome whether he is acquainted with the clan member or not, and whether the clan member is the house owner himself or the house owner's wife. Clan members in the host's section also present gifts to the visitor. Gifts are also given to clan members departing on or returning from a journey. A man who is working for wages in the Colony, where it is known to be difficult to obtain food, receives gifts of food from the members of his clan when business brings them or their neighbors to the Colony. In return he is expected to bring back imported articles as gifts when he comes home.

Although weddings and funerals are primarily social occasions the clan functions are of an economic nature. The wedding feast is given jointly by the clans of the bride and the groom. The bride receives gifts (kisäkis) suitable for a woman from the groom's clan, and the groom receives men's gifts from the bride's clan. Each clan tries to give more than the other. The gifts become the private property of the bride and the groom. Today money is often included among the gifts, and in the Japanese period a bride or groom sometimes received as much as 300 yen.

When a married man or woman dies, the clans of both the husband and wife and their relatives and friends come to sit up with the corpse, bringing gifts which are put on the coffin. In the event of a death all the members of the subclan must be notified, if necessary by messengers sent in opposite directions around the island so they meet on the far side. No attempt is made to notify all the members of the other subclans, but any clan member who hears of the death in time tries to come to the funeral. The gifts brought by the clans become the property of the widow or widower. Today money is also included among other gifts, and any expenses such as buying a pig for the feast and any debts are paid out of it. Gifts of money began in the Japanese period, when the amounts given varied from about 50 sen to about 5 yen, depending on what the donor could afford.

An individual himself provides the new clothes in which he is to be buried, purchasing them a long time in advance and keeping them stored away in readiness for the time when they will be needed. Many people kept their burial clothes untouched even in 1946, when mattresses and sails had all been cut up to make clothing, when men were forced to wear grass skirts or women's wraparounds, and when some women had no clothes at all. It is a disgrace for a Ponapean to die knowing that when his relatives open his box and go through his things they will not find an unused suit to bury him in. Should this occur, the person's brothers or sisters obtain the necessary garments, paying for them out of the money on the coffin, but taking every precaution to conceal what they are doing lest the entire clan be disgraced.

THE DISTRICT

Ponape is divided into five parts, Kiti, Matälanim, Ü, Nęt and Sokǫ̈s. These divisions, commonly referred to as districts, are separate tribes or kingdoms, each of which is politically independent. The Ponapean name for district (wëi) is perhaps best translated as "country." Ponapeans speak of the "Country of Kiti" (wëi ęn Kiti) and the "Country of Matälanim" (wëi ęn Matälanim) as they do of the "Country of Ponape" (wëi ęn Pǫ̈nipëi).

Throughout the island there is a basic cultural and linguistic uniformity which makes it possible to speak of the Ponapean language and the Ponapean culture. At the same time there are a number of variations that make it difficult to generalize for Ponape as a whole. The most radical difference is probably that between the matrilineal inheritance of property in Ü and the patrilineal inheritance in the other districts. In Ü, also, section chiefs are chosen from particular clans, whereas in other districts they are independent of clan affiliation. The northern half of the island (Nęt and half of Ü and Sokǫ̈s) is Catholic whereas the southern half (Kiti, Matälanim, and the other halves of Ü and Sokǫ̈s) is Protestant, and each faith has adopted its own system of spelling. The dialects of Ponapean seem to have about the same distribution as religion and orthography. In the South, for example, the name of Nęt District is pronounced much like the word "net" whereas in the North it is closer to "nut." The phoneme s in the South is sh in the North, giving a different pronunciation (Shokǫ̈sh) for the name of Sokǫ̈s District.

Each district is ruled by two parallel sets of twelve main chiefs (A1-A12, B1-B12), listed below. Their titles and order of rank vary somewhat from one district to another, but they have many points of resemblance. In addition there are an unknown number of individuals with minor district titles. A complete discussion of the functions and rules of succession to these titles is unnecessary here, but a certain amount of detail is essential in order to understand the structure of the district organization and rank. At the head of the two sets of chiefs are the Nänmäriki (A1) and the Nänikęn (B1), who are sometimes spoken of as the "King" or "Number One Chief" (A1) and the "Number Two Chief" (B1). These translations have some significance today, but are entirely misleading in terms of the historical functions of these two positions.

B1 is actually a close parallel to the "talking chief" of Samoa, and formerly was the actual administrator in all district affairs. A1 was only slightly higher in rank, but so "holy" (wäu) and so restricted by the forms of respect that he could not really rule. B1 settled all disputes, stopped clan feuds, led the people in warfare, and ordered the execution of anyone guilty of incest or of showing disrespect to the chiefs. B1 was always present when important matters were discussed in the district meeting house, while A1 stayed hidden in a small building of about eight by twelve feet erected behind the district house especially to protect A1 from the gaze of commoners. The house was guarded by A1's stewards, and in it B1 consulted A1 when he wished to ask A1's advice.

B1 made decisions on his own and simply reported them to A1, but in theory he ruled for A1 and expressed A1's wishes. If A1 disagreed with any action taken by B1, there was little he could do about it except try to get B1 to change his mind. He could not issue commands or take action except through B1 and because of his "holiness" he could not talk to or have direct

Tabulation C

District Chiefs, Sections, and Section Chiefs of the Districts of Ponape, 1946

	District Chiefs of Kiti		
A1.	Nänmäriki ẹn Kiti	B1.	Nänikẹn ẹn Kiti
A2.	Wasäi Kiti	B2.	Nälaim Kiti
A3.	Thäok Kiti	B3.	Nänsäoririn Kiti
A4.	Nọs Kiti	B4.	Nänmathọnïthẹth Kiti
A5.	Nanawän Kiti	B5.	Sọwẹllapalap Kiti
A6.	Nänipẽin Kiti	B6.	Ïsọalap Kiti
A7.	Näliklapalap Kiti	B7.	Lạpạ̈ririn Kiti
A8.	Nänkirọunpọnthakẹ Kiti	B8.	Äoririn Kiti
A9.	Nänïthlapalap Kiti	B9.	Nänipọnpẽin Kiti
A10.	Sauthẹl Kiti	B10.	Känikiririn Kiti
A11.	Äunthọloririn Kiti	B11.	Saulikẹntholẹn Kiti
A12.	Äunpọnpẽin Kiti	B12.	Äunthol ẹn Kiti

Sections of Kiti District	Titles of Section Chiefs
Wạnẹ (or Ọnẹ)	
K1. Rọi	1. (vacant)
K2. Rẹ̃ntu	2. Nänkrọn Rẹ̃ntu
K3. Muthọk (an island)	3. Saulikẹn Muthọk
K4. Sọunkrọ̃un	4. Saulikẹn Pal'ẽithi
K5. Pọrasapw	5. (held by A9)
K6. Olapạl	6. Lạpạnmathọn Olapạl
K7. Nänpälap	7. Saulikẹn Pälap
K8. Pänäis (or Maläluk)	8. Lüạn ẹn Maläluk
K9. Kapïnẹ	9. Lüạn ẹn Kapïnẹ
K10. Pọsain	10. Nänkrọn Pọsain (held by B4)
K11. Ononmwakọt	11. Lạpạnmathọn Ononmwakọt
K12. Pạ̈s	12. Lạpạnrọ̃lung
K13. Mwakọt	13. Saulikẹn Mwakọt
K14. Sọmọi (1 person only)	14. Kọrọ̃men Sọmọi (vacant, now under K13)
Kiti Proper	
K15. Änpẽinpẹwẹ	15. Saulikẹn Sọmọi
K16. Anpeinpä	16. Krọulikiak (held by A4)
K17. Pwok	17. Sawạn ẹn Pwok
K18. Kipär	18. Lüạn ẹn Kipär
K19. Rönkiti	19. Kạrau ẹn Wẽin (held by A6)
K20. Pwọipwọi	20. Sauthapạ
K21. Mänth	21. Kasa (held by B10)
K22. Wạnik	22. Lapạn Wạnik
K23. Salapwuk	23. Säum
K24. Lawatik	24. Sïpwẽn Lawatik
K25. Ọrẹ	25. Nänsäon Ọrẹ
K26. Thïathi	26. Nänmathọn Thïathi
K27. Pạtạpạt	27. Kanikin Akäk
K28. Aläuso (uninhabited)	28. Nänsäwin Ilẹu (vacant)
K29. Sawïso	29. Nansäon Sawiso
K30. S'ainuar	30. Saulikẹn Säinuar
K31. Palïapäilung	31. Saulikẹn Kạpin
K32. Maräo	32. Saulikẹn Maräo
K33. Tọmọrọ̃lung	33. Saulikẹn Lọ̃th
K34. Pwuthọi	34. Lüạn ẹn Pwuthọi
K35. Pälạng	35. Nänmathọn Pälạng (held by B2)
K36. Thïạn	36. Soukọ̃ng

Subdistrict Organization

First Subdistrict	Pwïn Käiẹu (K1-K14)	Under B1
Second Subdistrict	Pwïn Kariau (K15-K21)	Under A1
Third Subdistrict	Pwïn Kạsïlu (K22-K36)	Under A1

District Chiefs of Matälanim

A1. Nänmäriki ęn Matälanim	B1. Nänikęn ęn Matälanim
A2. Wasäi Matälanim	B2. Nälaim Matälanim
A3. Thäok Matälanim	B3. Nänsäoririn Matälanim
A4. Nǫs Matälanim	B4. Nänąpąs Matälanim
A5. Nanawän Matälanim	B5. Nänmathǫnïthęth Matälanim
A6. Nänipëin Matälanim	B6. Sǫwęllapalap Matälanim
A7. Nänkirǫunpǫnthakę Matälanim	B7. Ląpąririn Matälanim
A8. Näliklapalap Matälanim	B8. Äoririn Matälanim
A9. Lampwǫilapalap Matälanim	B9. Kanikiririn Matälanim
A10. Ïsǫalap Matälanim	B10. Nänsǫm ęn Wëi
A11. Näntu Matälanim	B11. Nänkrǫuririn Matälanim
A12. Marękëtik Matälanim	B12. Nänïthlapalap Matälanim

Sections of Matälanim District	Titles of Section Chiefs
M1. Alǫkap	1. Ląpąn Alǫkap
M2. Ïpwïtęk	2. Saulikęn Ïpwïtęk (held by B9)
M3. Kinakap	3. Nänmathǫn Kinakap (held by B4)
M4. Arü	4. Sauliken Arü
M5. Ǫa	5. Ląpąn Ǫa
M6. Masïsǫu	6. Sǫumathǫn Masïsǫu
M7. Likupw	7. Saulikęn Likupw
M8. Matipw	8. Ląpąnmathǫn Matipw (held by A4)
M9. Tholopwäil	9. Äun Tholopwäil
M10. Kapinę	10. Saulikęn Kapinę (held by A7)
M11. Takäięu	11. Kęlak Takäięu
M12. Ętïęlang	12. Sǫumathǫn Ętïęlang
M13. Kitam	13. Krǫunën Lęthau
M14. Lęthau	14. Läpę Lęthau
M15. Alïalawï	15. Saulikęn Pälap
M16. Thïathï	16. Krǫunęn Thïathï
M17. Pǫnauląng	17. Saukąpąrą
M18. Sapwęrąk	18. Saulikęn Sapwęrąk (held by B7)
M19. Kapirǫi	19. Sauąnęn Kapirǫi
M20. Tamwęrǫi	20. Läpęn Tamwęrǫi
M21. Anipąs	21. Äun Anipąs
M22. Akäk	22. Kanikin Akäk
M23. Wapar	23. Läpin Wapar
M24. Lǫthpęwę	24. Saulikęn Lǫth
M25. Lǫthpä	25. Ląpąn Lǫthpä
M26. Tamwąn (an island)	26. Äun Säuna
M27. Näniwëi (and island)	27. Sęrïnäin Patalę
M28. Lęak (an island)	28. Saulikęn Lęak (held by B2)

District Chiefs of Ü

A1. Nänmäriki ęn Ü	B1. Nänikęn ęn Ü
A2. Wasäi Ü	B2. Nälaim Ü
A3. Thäok Ü	B3. Nänsäoririn Ü
A4. Nǫs Ü	B4. Nänąpąs Ü
A5. Nanawän Ü	B5. Sǫwęllapalap Ü
A6. Nänipëin Ü	B6. Nänmathǫnïthęth Ü
A7. Nänkirǫunpǫnthakę Ü	B7. Lapąririn Ü
A8. Näliklapalap Ü	B8. Äoririn Ü
A9. Nänïthlapalap Ü	B9. Nänipëiririn Ü
A10. Lampwǫilapalap Ü	B10. Lampwǫiririn Ü
A11. Näntu Ü	B11. Nänsǫumęririn Ü
A12. Äunthǫloririn Ü	B12. Äunpǫnpein Ü

Sections of Ü District	Titles of Section Chiefs
U1. Awakpä	1. Saulikęn Awakpä
U2. Awakpęwę	2. Saulikęn Awakpęwę
U3. Ü Kaięu	3. no section chief
U4. Ü Kariau	4. no section chief
U5. Salatak	5. Sǫumathäo ęn Salatak
U6. Rǫi	6. Saulikęn Thïanso
U7. Takaięu	7. Kęlak ęn Takaięu

Sections of Ü District (cont'd)	Titles of Section Chiefs (cont'd)
U8. Tą̈pąk (an island)	8. Sąwąn ęn Tą̈pąk
U9. Mänth Paithi (an island)	9. Läpęn Mänth Päithi
U10. Mänth Pëithak (an island)	10. Sauthęl ęn Mänth Pëithak

Section 3 and 4 were known as Näniwëi until they were divided in the Japanese period; they had no section chiefs since they were the district headquarters. Sections 1 and 2 were formerly a single section which was also divided by the Japanese.

District Chiefs of Nęt

A1. Nänmäriki ęn Nęt	B1. Nänikęn ęn Nęt
A2. Wasäi Nęt	B2. Nälaim Nęt
A3. Thäok Nęt	B3. Nänsäoririn Nęt
A4. Nǫ̈s Nęt	B4. Nänąpąs Nęt
A5. Nanawän Nęt	B5. Nänmathǫ̈nïthęth Nęt
A6. Näniпëin Nęt	B6. Sǫwellapalap Nęt
A7. Nänkirǫunpǫ̈nthakę Nęt	B7. Ląpą̈ririn Nęt
A8. Näliklapalap Nęt	B8. Äoririn Nęt
A9. Ląmpwǫ̈ilapalap Nęt	B9. Känikiririn Nęt
A10. Nänïthlapalap Nęt	B10. Nänipǫ̈npëin Nęt
A11. Sauthęl Nęt	B11. Äunpǫ̈npëin Nęt
A12. Marękëtik Nęt	B12. Äuntholęn Nęt

Sections of Nęt District	Titles of Section Chiefs
N1. Päręm (an island, being resettled)	1. Ląpąn Päręm
N2. Tamwęrǫ̈i (uninhabited)	2. Nänsǫusęth ęn Nęt
N3. Ląngąr (an island, uninhabited)	3. Ląpąn Ląngąr
N4. Läpinrǫ̈i (2 families or less)	4. Wasäiląng
N5. Sąkąrąnkäuki (2 families or less)	5. (held by B3)
N6. Lukąpąs (2 families or less)	6. Säiniap
N7. Arąką (2 families or less)	7. Krǫ̈un Rǫ̈i
N8. Pǫ̈npäil (2 families or less)	8. Saulikęn Nęt
N9. Pëilą	9. Nänsawęnilęu
N10. Thǫ̈lakäipęwę	10. Saulikęn Thǫ̈lakäi
N11. Nïnsokisok (2 families or less)	11. Lüwärai
N12. Nänpǫ̈nsapw (2 families or less)	12.
N13. Pali Ais	13. Saulikęn Ais
N14. Thǫ̈lakäipä	14. (formerly under N10)
N15. Mäitik	15. Nänǫ̈n Mäitik
N16. Äiriką	16. Sǫ̈umathawęn Äiriką
N17. Nänipïl	17. Saulikęn Sokǫla
N18. Kämär	18. Sǫu Kämär
N19. Męsęniąng (uninhabited)	19. Nälăim Matipw
N20. Pǫ̈nräkięth (Greenwich Islanders)	20. Krǫulangär
N21. Tholonięr	21. Krǫun ęn Thǫ̈rapap

The section organization no longer functions, having been replaced by the division into subdistricts. Section 1 and 3 were taken over by the Japanese for military installations and all natives were evacuated. Section 1 is now being resettled. Nänkawäth (uninhabited) was also once a Section of Nęt District.

Subdistrict Organization

First Subdistrict	Pwïn Kaięu	(N1-N10)
Second Subdistrict	Pwïn Kariau	(N11-N14)
Third Subdistrict	Pwïn Kasïlu	(N15-N18)
Fourth Subdistrict	Pwïn Kapäiu	(N19-N21)

District Chiefs of Sokǫ̈s

A1. Nänmäriki ęn Sokǫ̈s	B1. Nänikęn ęn Sokǫ̈s
A2. Wasäi Sokǫ̈s	B2. Nälaim Sokǫ̈s
A3. Thäok Sǫkǫ̈s	B3. Nänsäoririn Sokǫ̈s
A4. Nǫ̈s Sokǫ̈s	B4. Nänąpąs Sokǫ̈s
A5. Nanawän Sokǫ̈s	B5. Nänmathǫ̈nïthęth Sokǫ̈s
A6. Nänkirǫunpǫ̈nthakę Sokǫ̈s	B6. Sǫwęllapalap Sokǫ̈s
A7. Näliklapalap Sokǫ̈s	B7. Sǫ̈umathǫ̈n Sokǫ̈s
A8. Nänïthlapalap Sokǫ̈s	B8. Äun Sokǫ̈s
A9. Ląmpwǫ̈ilapalap Sokǫ̈s	B9. Ląpąn Sokǫ̈s

District Chiefs of Sokȫs (cont'd)

A10. Ląpąnmathão ęn Sokȫs	B10. Nänkirǫun Sokȫs
A11. Sǫwęlęn Wasäi Sokȫs	B11. Nänikąi Sokȫs
A12. Känikin Sokȫs	B12 Känikiririn Sokȫs

Former Sections of Sokȫs District

Sokȫs Proper	Palikir
S1. Tänipëi	S14. Pönmal
S2. Äir	S15. Sąkąrą
S3. Lupw	S16. Pǫęnsoi
S4. Mwalok	S17. Äumǫr
S5. Sakaralap	S18. Nïkäwą
S6. Lisäuonon	S18. Salatak
S7. Nänimwinsapw	S20. Mwäng pailong
S8. Solęthi	S21. Mwäng paiyëi
S9. Kąpinipwęl	S22. Ïol
S10. Ïpwal	S23. Tamwęrõi
S11. Roią	S24. Nänlong
S12. Tamwęrõi	S25. Sõunthao
S13. Pakëin (an atoll)	S26. Tawäk (a former island)
	S27. Tomara
	S28. Kipäralap

Present Sections of Sokȫs District

Section	Inhabitants	Composition
A. Mwǫkil	Mokil	(S1, S2, S12)
B. Pingilap	Pingelap	(S3, S4, S5, S6)
C. Sathawan	Mortlock	(S7)
D. Thą	Mortlock	(S9, S11)
E. Luknõt	Mortlock	(S8)
F. Ngatik	Ngatik	(S10)
G. Palikir	Ponape	(S14-S25, S28)
H. Tomara	Yap	(S27)

S13 was owned by Nambo and was uninhabited except for plantation laborers.
S26 was formerly an island which has been destroyed by waves.

contact with anyone except B1, his own stewards, and his own family. It was possible for B1 to rule as he liked with no regard for A1's wishes, but such situations, if they did occur, were rare because A1 and B1, though of different clans, were always closely related if they were not actually father and son, as they usually were.

The positions of Nänmäriki and Nänikęn have been modified considerably through foreign contact. Under the Spanish there was little change except that A1 was given a stipend. The Germans continued the stipend but, perhaps through ignorance, required A1 to appear in public and carry on all District affairs himself. A1, who had had little experience in judging criminal cases and settling land disputes, at first turned the work over to B1 wherever possible. Gradually A1 assumed the administrative functions, except in Kiti District where the late A1 was a cripple who could not get about. As A1 began to appear in public and take an active part in district affairs, the restrictions that prevented commoners from looking at him, talking to him, coming near him, or handing things to him had to be abandoned, and A1 "lost his holiness."

The Japanese continued the precedent set by the Germans, giving A1 the position of district administrator and the Japanese title of Sosoncho (Sõsõnso). They modified it to the extent that B1 was officially made the district judge. The American administration followed the Japanese pattern. Military Government officers dealt primarily with A1 in spite of the fact that in Kiti, Ü, and Nęt districts the most experienced, best informed, and most influential chief was B1.

In early times succession to district chieftainship was strictly regulated by membership in the clan and subclan. The Nänmäriki (A1) and the A chiefs beneath him (A2-A12) were all chosen from the highest ranking subclan of a particular clan. It was only when the top subclan died out that the other members of the clan could become A1, and only if the top subclan became too small to fill all the positions could they hold any of the A titles. One of the important reasons for the lack of respect expressed toward the A1 of Kiti District in 1946 seemed to be that, although he came from what was the highest ranking subclan of the ruling clan, he was not a member of what had previously been the ruling subclan, which became extinct with the death of his predecessor, the father of the present B1. A similar system held for the B chiefs, but in some districts these could be chosen from any of several specified clans. The clans and subclans from which the A and B chiefs are chosen are sometimes referred to here as "ruling clans" and "ruling subclans," but this should not be taken to mean that the clan or subclan ruled as such.

In the early days all A chiefs in Kiti District were chosen from the highest ranking subclan of Clan 1,

whereas the B chiefs were all members of the highest ranking subclan of Clan 20. Through infant betrothal the members of these two subclans were intermarried, so that A1 was a member of the highest ranking subclan of Clan 1, and both his sons and his father were members of the highest ranking subclan of Clan 20. Father and son commonly ruled as A1 and B1 or B1 and A1. In Ū District the A chiefs had to be members of the first subclan of Clan 18, and any member of Clans 22, 15, and 7 whose father was an A chief and eligible to become A1 could become a B chief. In Matäalanim all A chiefs had to be members of the first subclan of Clan 7, and any member of Clans 15 or 18 whose father was a potential A1 or any child of the actual A1 regardless of clan could become a B chief.

At the present time there are five independent districts but previously there were only three. What is now Sokȫs District was formerly a part of Kiti, and Nęt was formerly a part of Ū. Nęt did not become an independent district until the Spanish period, when it set up its own chiefs, Ląpān Nęt, who was the equivalent of A1, and Nänsǫuseth, who was the equivalent of B1. As a reward for their support at the time of the Kawäth clan war in 1910 the Germans gave these chiefs the titles of Nänmäriki and Nänikęn. At the present time (1946) the A1, Max, is the fifth ruler of Nęt, his predecessor (Eduardo), the second ruler, having been the first to bear the title Nänmäriki. Sokȫs was ruled by a Wasäi (A2) and a Nänikęn (B1) after it became a separate district, some time in the Spanish period. Shortly after the Japanese arrived they allowed Sokȫs District to use the title of Nänmäriki also, and the present A1 is the third to hold this title in Sokȫs.

The present A1 of Nęt District is not a member of the ruling subclan, and this is a sore point among some of the members of the district. He is the son of the present B1 and the husband of a woman of the ruling subclan, for whom it is said he holds the title. All other A1 chiefs are members of Clan 10 and in theory only members of the first subclan of this clan can become A1, whereas B1 is chosen from Clan 17. In Sokȫs the picture is unique because of the large number of out-islanders. The ruling A1, who was appointed by the Japanese, and A3, A10, and B12 are Mortlocks and A2 is a Ngatik. The Kawäth Clan (10), which fought the Germans (see p. 13 above) is the traditional ruling clan on the A side. The former ruling Kawäth subclan now lives entirely in Nęt District, so the second subclan is highest ranking in Sokȫs. At present the second subclan fills the positions of A4 and A5, A6 is from the fourth subclan, and A8, A9 and A12 are from the fifth. Sȫumathǫn Sokȫs (B7) whose predecessor led the war against the Germans is not from the Kawäth Clan today. Formerly all B chiefs in Sokȫs came from Clan 17, but today B1 may be chosen from either Clan 17 or 7. At present B1, B3, and B4 are from Clan 17 and B7, B9, B10, and B11 are from Clan 7. A7, A11, B2, B5, B6, and B8 are Ponapeans from other clans.

Departures from the earlier rules of succession have also occurred in the other districts, with the result that some of the lower A and B titles are no longer occupied by members of the traditional ruling clans and subclans. This has been owing to a number of factors including the decrease in size of some of the ruling subclans, the interference in succession by the Japanese who wanted Japanese-speaking chiefs, and the device of giving district titles to get a man's pigs and yams. In Kiti, Matälanim, and Ū, A1 and B1 must still come from the highest ranking subclan, whereas A1-A4 and B1-B2 must come from the ruling clans if not from the ruling subclan. In Matälanim, for example, chiefs A1, A4, A5, and A10, who are the only males in the district from the ruling subclan, are from the first subclan of Clan 7; A2, A3, A7, A11, and A12 are from the second subclan; and A6, A8, and A9 are from other clans. In Ū District, A1, A2, A5, A7, A8, A9, A10, A12 as well as B9, B10, B11, and B12 are from the first subclan of Clan 18; A3 is from the second subclan; A4 is from the third and last subclan; and A6 and A11 are from different clans.

If the changes that have taken place are taken into account, the clans from which the top district chiefs are chosen can be listed in tabular form (see below).

TABLE 13

"Ruling Clans" of the Five Districts of Ponape

District	Nänmäriki (A1)	Nänikęn (B1)
Kiti	1 Tipwiniman tǫntǫl	20 Lipitan
Matälanim	7 Tipwinpänmäi	15 Tipwin Wäi; 18 Lasïalap; or sons of A1.
Ū	18 Lasïalap	22 Lăthąk; 15 Tipwin Wäi; or 7 Tipwinpänmäi
Nęt	10 Sǫun Kawäth	17 Tipwilap
Sokȫs	10 Sǫun Kawäth	17 Tipwilap; 7 Tipwinpänmäi

Succession in chieftainship was normally progressive, with A1 being succeeded by A2, A2 by A3, A3 by A4, and so on. A chief might start as A12 and eventually work up step by step to the position of A1 as those above him died, but it was possible for A1 and B1 to promote a chief over one or more of those above him. Today this pattern has been modified. Certain chiefs can move no higher than their present position because they do not belong to the proper clan or subclan. Thus A2 of Matälanim cannot become A1 unless the first subclan of the ruling clan becomes extinct. The pattern of succession is still in a state of flux, and further modifications can be expected.

Formerly the men of the district built elaborately carved canoes (wärasap) for the use of the chiefs and nobility, specially designed houses (ïmwanäi) for A1 and B1, and guest houses (ïmw ęn päthok) for A1 and B1 to entertain visiting chiefs (A1-A4, B1-B4) from other districts, in addition to the small building behind the district meetinghouse where A1 hid from the public. All of these have disappeared today and may have been the property of the chief rather than of the district. District meetinghouses (ïmw ęn wëi) and district feast houses (näs ęn wëi) are still built and owned by the district. The district members were also formerly responsible for the support of the chiefs (A1 and B1) and their families through feasts and first fruits (see chapter 6) given in return for the use of the land. When the ownership of the land was transferred from the chiefs to the people by the Germans, unassigned land outside the Colony was designated as district property.

Kiti District is divided into two halves, one of which is known as Wąnę (or Ōnę) and the other simply as Kiti.

This division is said to be the result of an earlier war in which Wąnę, which was formerly independent, was conquered by Kiti. Until private titles were issued to the land, A1 owned Kiti proper while B1 owned Wąnę, and each received first fruits and feasts from the people living within his half of the district. Matälanim and Sokȫs are also recognized as having two halves, although privileges and authority in these districts are not divided between A1 and B1. A distinction for which the historical reasons are not known is made between Öa and Matälanim proper, and between Palikir which lies on the main island and Sokȫs proper which is a small island.

THE SECTION AND THE SUBDISTRICT

Each district is divided into a number of sections (kȫusap), which generally include fewer than a hundred individuals. One of the striking characteristics of Ponape is its lack of villages. Houses are scattered along the shore of the island, each built on its own farmstead and separated from neighboring houses by the landholdings themselves. There are no noticeable clusters of houses, outside the former Japanese towns of Colony and Sapalap, even about the stores, except for Japanese buildings and the settlements of some of the out-islanders. The place of the village in the social life of Ponape is taken by the section.

In 1934 the Japanese officially reorganized Nęt, Matälanim, and Kiti districts by grouping several sections together into subdistricts (pwïn). The groupings themselves grew out of the native cooperative work groups (Minimin, pwïn) which developed about 1921. The reorganization makes particular sense in Nęt where many sections now have no residents or only two or three, in part because the Japanese acquired land for military purposes and for the expansion of the Colony and in part because families have abandoned rocky and infertile farmsteads. The subdistrict here functions much as the section does in other districts. Sokȫs District was reorganized earlier, on the basis of sections rather than subdistricts, when the land confiscated from the people deported to Palau by the Germans was resettled by immigrant out-islanders. Under this reorganization Palikir, which was not resettled and most of which was held by the Japanese as government land and leased to Japanese colonists, has been reduced from the status of half a district to that of a section.

Each section is headed by a section chief (käun ęn kȫusap, sȫumas ęn kȫusap) under whom a number of minor chiefs hold section titles. Section chiefs are appointed by A1 and B1 after they have determined the wishes of the members of the section. Section titles are independent of clan affiliation except in Ü District, where all section chiefs are chosen from specified clans. The section chiefs act as the local representative of A1. Section chiefs and the names of sections, with their present reorganization, are listed by district (see p. 22 above).

Each section has a feast house (näs ęn kȫusap) near the house of the section chief, about which the community life centers. Until the German period the whole section came together to prepare pit breadfruit (mär ęn kȫusap) for the chief to use when giving a feast for important section guests. Section pit breadfruit is not made today, but some of those prepared earlier are still being used. Formerly there was also a separate meetinghouse (ïmw ęn kȫusap) for the section.

In addition the section owns other property made by its members and used for their common benefit. Some regard this as the property of the section chief, who administers its use, and in Ü it is considered the property of the clan from which the section chief is chosen, but it is usually regarded as belonging to the members of the section as a group. Each section has its own section canoe (wär ęn kȫusap) and canoe house (näs ęn wär, ïmw ęn wär), and until they wore out during the war some had section seines (ük ęn kȫusap), though this practice seemed to be disappearing. Until the German period there were also section fish weirs (mäęn kȫusap). An individual who wished to use the section net and canoe arranged with the section chief to take them on a day when they were free. It was customary to present a small part of the catch as a "gift" to each family in the section and to the section chief. The section, like the clan, operates as a cooperative work group in making section canoes, seines, and buildings, but these are the common property of the group rather than the private property of any of its members. The section also functions as a group in making feasts and presenting "first fruits" to the district chiefs through the section chief.

THE FARMSTEAD

Each section is composed of farmsteads (paliensap) or individual landholdings. Generally there are fewer than fifteen farmsteads to a section, most of which are about four or five hectares in size. Each farmstead has a distinctive name and is in turn composed of a number of parts (mȫkotinsap, mȫkot, or sïnoip), also with distinctive names, which were the basis of dividing the land among a man's heirs. The changes that have taken place in landownership and inheritance are discussed under "Property" (see chapter 6).

The farmstead is occupied by the household, whose members are called tȫnimwai and may include more than one immediate family. The household has its basis in kinship but is not identical with either the immediate family or the extended family, since it may be larger than the former and may include only a part of the latter. In addition it may include distantly related clan members or nonrelatives. The members of the household who are not members of the extended family (panäinäi) are called kȫmpȫkepä. The head of the household, who is either the man who owns the farmstead or the husband of the woman who owns it, is referred to as "House chief" (käun ęn ïmw), a term which recently has been derived from the name for section chief.

OCCUPATIONAL ORGANIZATIONS

About 1921 a new type of cooperative work group was established on Ponape called the Minimin, the meaning of which is given as "United in heart." It was originally a Ponapean idea that spread very rapidly over the whole island. Later it was more formally organized and expanded in its functions by the Japanese. Whereas the clan helped its members with certain specific and rather unusual tasks, the Minimin helped in the routine everyday work of farming and copra manufacture. It helped in clearing the farm, planting, gathering and husking coconuts, cutting copra, building drying sheds, planting bananas, gathering ivory nuts, or whatever work

a member wished to have done. It did not help with planting, tying, or harvesting yams, since yams are secret and a member would not want his neighbors to know the kind or the number he had planted. It did not help in harvesting breadfruit, since yams are usually planted among the trees, nor in planting breadfruit since this did not have to be done regularly on a large scale. Membership was voluntary and not everyone joined.

Each Minimin covered several adjacent sections which were referred to as a "group" or "crowd" (pwĭn) and this term was also used as a synonym for Minimin. Later, these groupings of sections were made the basis of the subdistricts officially recognized by the Japanese. The organization of one of the Minimin in Matălanim District, covering the fifth subdistrict (pwĭn kalimău) and a partial list of members is given below:

Section M21.	A.	Äun Anipas, Timŏtheus, Năniķi.
Section M22.	A.	Kanikin Akäk, Soulikęna, Ērus.
Section M23.	A.	Älipin (President), Ęnęrĭko, Läpin Wapar.
	B.	Thomas, Pęn.
Section M24.	A.	Linkęn, Ęmĭl, Kaniki Löth.
	B.	Öltęn.
Section M25.	A.	Ląpąnsęth, Wäręn, Kanikin sapöas, Lük, Mŏsis.
	B.	Äun Löth.

The Minimin held a meeting each month to arrange the work schedule for the following month and to decide whether the members would all work together or would split up into smaller groups. The members in M24A, or those in M24A and M24B, for example, might agree to work by themselves for a month, while the rest of the Minimin worked in a larger group. Other small groups could also arrange to work by themselves; the Minimin might divide into two fairly equal parts; or a member, if he wished, could drop out and work alone for a month. The organization of the Minimin was extremely flexible and was readily adapted in size to the requirements of various farming activities. Each work group that was formed for the month also decided at the meeting whether it would work half a day, a whole day, or two days at a time for each member. Or the group might agree to divide the work by tasks and husk 1000 coconuts or clear a certain number of coconut trees for each member in the work group. If the group agreed to work by the day, each member in turn assigned the group whatever work he wanted done. He also provided their food, which was usually cooked by one of the work group appointed by the group itself or by its chief.

Each Minimin had a president or "chief" (käun ęn minimin, käun ęn pwĭn) who recorded the working schedule for the month and saw that it was carried out in the proper order. When the Minimin split into smaller work groups, a member was appointed as "little chief" (käun tikitik) for each group for the month. Women had similar cooperatives through which they helped each other in planting pineapple, bananas, taro, and other women's crops. During the period of forced labor they also helped in husking coconuts.

The usual working days were Tuesday through Friday, and the hours of work from 6 to 8, 9 to 12 and 1 to 5 and, on half days, from 6 to 8 and 9 to 12. Sunday was a day of rest and on Mondays and Saturdays each man worked by himself at home or on his own farm. Unless he had a legitimate excuse, a member who missed work had to pay the equivalent of a day's wages for a common laborer to the man for whom the group was working.

About 1942 the Minimin in the various parts of the island were combined by the Japanese into an organization known as Seisan Kumiai. This was a cooperative that was given complete responsibility for the purchase of copra and all other export crops and for the sale of all imported goods in Kiti, Matălanim, and Ŭ Districts. No cooperative stores were established in Sokŏs or Nęt, where export produce was delivered directly to the central office of the cooperative, and imported goods were purchased from private stores in the Colony, although the Minimin functioned in these districts also as a cooperative work group.

Membership was voluntary. In the fifth subdistrict of Matălanim about thirty men paid the membership fee of 50 sen, which went to the central office. The first shipment of trade goods was issued on credit and as they were sold, copra was purchased with the money received. The trade goods were charged to the store at retail prices and copra was credited at the purchase price. All bookkeeping and calculations of profits were done by Japanese at the central office in the Colony, but one store manager was informed that the initial debt of his store was paid off by profits within three months.

In Matălanim six stores (in Sections M4, M9, M14, M18, M24, M26) that previously had been privately operated were informed that they must become Seisan Kumiai stores, and that all profits would be used for the benefit of the district. The store owners were given no choice in the matter, and the other private stores in the district were closed. The store managers appointed by the Japanese were given a monthly stipend, which in four cases was 10 yen a month, and they also received an annual bonus based on the year's trade, but there was no further compensation for the use of the store building or equipment. The store managers were appointed as official copra inspectors in their areas.

Eventually Seisan Kumiai bought and operated its own boats, greatly reducing shipping costs. At first the captain, a Ponapean from Nęt District named Fred who became Chief of Police under the Military Government, was allowed a fixed amount per ton of copra delivered but later he was put on a regular salary. The store managers paid cash for goods delivered by the boat and received cash for copra put on board. The payments were made either to Fred or to a Japanese official of the Seisan Kumiai who often accompanied Fred to handle the money. Occasionally the stores were forced to operate without paying cash to producers for their copra because the boat did not bring along enough money.

The Minimin president was given a commission that varied with the amount of produce shipped, and he was required to send a copy of the month's cooperative work schedule to the district office. The Nänmăriki (A1) of Matălanim and two men with minor district titles (Soumathon Matălanim and Äuntholęnririn) were made salaried inspectors of the six stores in the district. There was some trouble in Matălanim District because the inspectors kept the storekeepers' annual bonus for themselves.

Aside from these difficulties, the cooperative stores worked well. There were minor complaints in Nęt District because the central office was slow in paying for copra delivered and in Kiti against some of the Japanese

store managers. Informants knew of no complaints that arose out of the cooperative work groups themselves. Ponapeans sometimes characterized the Seisan Kumiai as being "owned by the Ponapeans but run by the Japanese," but they highly approved of the idea and wanted to see it revived again. A direct effort should be made to re-establish the Seisan Kumiai and encourage its growth. It is a valuable foundation on which any American-sponsored trading program can and should be built.

When the U.S.C.C. stores were set up in the five Districts, the chiefs were told that each district could raise its capital and run its stores the way it wanted. It was suggested, however, that the U.S.C.C. preferred to have a few, rather than many, owners of the store. In some districts the ownership of the stores seemed unrelated to the Seisan Kumiai pattern, partly because of the haste with which they were organized and of the financial situation at the time. In Nęt, for example, the original capital of $465 was contributed by fourteen individuals, of whom one gave $150 and another $100. The chiefs of Nęt said that the district wanted to own and run the store on a cooperative basis, but decided that there was no other way to raise the capital. They said that these contributions were made as loans to the district and would be repaid with interest from store profits. Nevertheless, with this beginning there was the possibility that the store might become an enterprise of the family of chiefs (B1 and A1 were father and son). A rule that any native has the right to become part-owner at any time by contributing $5 might be sufficient to prevent such a development. In Kiti, where the capital was raised by small contributions by a large number of people, this danger was not apparent and the organization of the District store seemed closest to that of the Seisan Kumiai.

OTHER ASSOCIATIONS

It is said that in the native period there were clubhouses in which the young men of the section congregated. These had disappeared by the end of the Spanish period and no clubs, societies, age grades, or associations other than the Minimin or Seisan Kumiai developed.

RANK AND STATUS

Ponapean society is by no means democratic or equalitarian. The common people (aramas mwāl) are separated from the nobility (sǭupēithi, sǭupāithi) and chiefs by a wide social gulf. Status is closely related to the clans and the subclans; but whereas the clan structure is strictly matrilineal, rank is inherited from both the mother and the father. Through membership in a particular subclan and the hereditary rank of the father and the mother, certain limits are set at birth on the statuses that an individual is eligible for. Within these limits there is room for competition for prestige and status in the district or section title that an individual may achieve.

Wāu or mana.—Rank is related to the concept of wāu, which is frequently translated by the Ponapeans as "holiness" but which usually can be effectively translated as "honor" or "respect." Wāu literally means "valley" and refers to the wide gulf that separates the nobility from the common people socially. It is explained that it is as difficult and dangerous to try to bridge this gap as to jump from one mountaintop to another.

Except for the fact that informants disagree as to whether it has supernatural sanctions, wāu is comparable to the Polynesian concept of mana. Chief B1 of Kiti said that there were no supernatural sanctions that prevented a commoner from walking up and touching A1; he would simply be executed for showing disrespect. Chief B1 of Ü, on the other hand, said that someone who remained up in a tree when A1 passed below or who climbed a tree on which the chief had put his taboo (inapwi) would become ill. This, he said, would happen regardless of whether either the individual or the chief were aware of the violation of the taboo. The man would find out the cause of his sickness from a diviner, and his clansmen would take a pig and kava to the chief to ask his forgiveness and to beg the chief to pray to the deity of his clan to make the man well again.

Wāu can be inherited through the blood; it is associated with the clan and is inherited primarily from the mother, but it can come also from the father. Wāu can also be acquired; when a noble is given the title of A1, his wāu is increased, and a commoner can acquire wāu by being appointed section chief. Whether it is achieved or inherited, wāu stems from the chiefs from whom titles are received and descent is traced. Wāu is relative rather than absolute, and an individual's rank depends on whether he has more or less wāu than others have.

Privileges of rank.—Associated with rank and status are the social courtesies and economic privileges reserved for those at the top of the social scale. Whether or not these privileges were believed to have supernatural sanctions, they were enforced by B1 through the penalty of execution until the German period. At that time, when the chief's authority to impose death penalties was abolished and when A1 became a "public" official and began to lose his wāu, the privileges began to disappear, although many are still observed today.

At all feasts people are seated according to rank. The term used for the nobility (sǭupēithi, sǭupāithi) is said to mean literally those who have the right to sit facing the people, a reference to the fact that the highest ranking individuals at a feast or meeting sit on a raised platform at the head of the feast house, those of intermediate rank sit around the edges, and the commoners are placed at the rear. The Nānmāriki and other A chiefs sit in order along one side of the house, and the Nānikęn and the B chiefs sit on the other. When the Nānmāriki is not present at a section feast, the section chief takes his place. Food and kava are also served at feasts in order of rank.

No one is permitted to sit or stand so that his head is as high as that of A1 or B1. The platforms of the feast houses, which formerly were made of stone, are high enough so that the commoners can stand up to cook and move about without rising above the chiefs. Even the lesser district chiefs (A2-A12, B2-B12) must bow down low when walking about the platform. It is impossible to observe this rule in all the new situations in which the chiefs are called upon to function, such as in the district offices or in the monthly meetings of the chiefs of all districts, but it still holds at section feasts. It is no longer necessary for a man to climb down from a tree if he is picking coconuts or

breadfruit when A1 or B1 passes, but people still bow down when they meet the chiefs on the road today and when poling a canoe past them even sit down in the canoe until bidden to rise.

Nothing could be handed directly to A1 or B1 or received directly from them. If a garland of flowers was given to them it was presented on the end of a stick; when a basket of first fruits was offered it was laid on the ground before them or transferred to them through their stewards. Chiefs A1-A5 and B1-B2 had stewards who ran errands and carried messages for them and in general acted as intermediaries in dealing with persons of lower rank. They also cooked and prepared kava for the chiefs at home and waited on the chiefs at feasts. The stewards of A1 and B1 were permitted to move about on the front of the feast house platform serving food and kava to the chiefs. Only his own stewards and chief B1 could hand things to A1 or come close to him in public. In handing kava and food to the chiefs, the stewards support their right elbows with their left hands and in receiving things from them they support the chief's arm in the same manner. The four stewards of B1 were the ones who actually made arrests and performed executions at his command for violations of the taboos against incest or for showing disrespect to the chiefs. The seven stewards of A1 took turns in standing guard at his house to keep commoners away.

Formerly a commoner could not walk within thirty feet of A1 or B1. If he met them coming along the road, he had to leave the path and hide in the trees until they passed. When walking past a house where they were, he again had to leave the path and pass by out of sight through the trees. These forms again have been modified since the German period, so that today a person simply stops and bows low until the chief has passed on the road, or bows low while walking past his house.

Formerly no one could look directly at A1, and no one but his stewards and B1 could speak to A1 except in greeting. These forms of courtesy were so restrictive in the old days that A1 was isolated from the people whom he theoretically ruled. Although B1 had enough freedom in dealing with members of the district to carry on the business of the district for A1, he was still treated with all the respect due to him as the second ranking chief.

Deference to rank is also shown by the unusual lengthening of long vowels and by the use of honorific speech, or special forms for words used in addressing individuals of high rank. In Ponapean the pronoun "your" has five different forms which are used in addressing (1) A1; (2) A1's real wife (ĩnanmõth); (3) A2-A4 and B1-B4 and their wives; (4) A5-A12, B5-B12 and their wives, and others of intermediate rank including the sẹrĩso and their wives, the stewards, and section chiefs; and (5) the commoners. The word used to catch someone's attention ("look here") has three different forms, the first of which is used for A1-A4, B1-B4, and their wives, whereas the second and third are used for groups (4) and (5) above.

To say "thank you" to chiefs A1-A4 or B1-B4 and their wives, the correct form is "Kalãngẹn ẹn mẽnsap aka," but for all other adults the correct phrase is "Kalãngẹn ẹn kọmwi." There is a third form, "Mẹlau," which is used only for small children. Curiously, the phrase for "Thank you" that was taken up by American Navy and civilian personnel on Ponape, "Mẹlãu kalãimun" ("Thanks big"), is one which in the first place is not good Ponapean, in the second place was invented by the Japanese in an attempt to translate "Thank you very much," and in the third place should not be applied to adults. It is disturbing to hear this phrase said to a chief or dignified old man or woman by an American who is attempting to be friendly, or to an American officer by a Ponapean who is afraid that Americans would not understand the proper form.

Whereas marriages among the commoners were monogamous and a strict code of sexual morality was enforced by the chiefs, certain chiefs (A1-A4 and B1-B2) were formerly permitted to have several wives. Their first or principal wives were taken in "real marriage" after betrothal in infancy. In addition they took several other women known as pạkại (literally, "besides") in common marriage and had several other women in the household as personal servants (lĩthu) to whom they had sexual access. The women of both these latter groups were chosen only for their beauty. The only duty of the secondary wives was to please the chiefs, enjoy themselves, and make belts and skirts for the chiefs if they felt so inclined. The personal servants (lĩthu) carried water and firewood, cleaned the house, and did all the other household work normally performed by the wife. The principal wife was chosen from the opposite subclan and was herself a noble of high birth. She was called "Mother of Sitting" (ĩnanmõth), referring to the fact that there was nothing for her to do since her work was all done for her by others.

The household of these same top chiefs also included the stewards and male servants (lãthu) who did the more menial work normally performed by the husband. There are still stewards today but secondary wives and personal female servants disappeared in most districts in the pre-Spanish period as the result of missionary pressure. They continued in Palikir until 1910 when the last remaining ones were deported to Palau with the others who had fought against the Germans.

The top chiefs (A1 and B1) formerly had elaborately decorated canoes and houses of special form, forbidden to commoners, which were built for them by the members of the district. In addition, the top chiefs used to wear a special form of coconut skirt, also forbidden to commoners, in which each strand was carefully crimped with a shell (kõpil) giving it a distinctive fluffy appearance. Sea turtles, certain of the largest fishes (tẽp, mãrar, and mãuth), and one large variety of yams (kạpin namõu pwẹtẹpwẹt) were formerly taboo to commoners and could be eaten only by the chiefs and nobles, to whom they had to be taken. The chiefs and their families were also provided with food by the first fruits and the feasts given to them by members of the districts.

An unending series of feasts was also given by the various sections to the district chief who owned the land, and in the old days it was unnecessary for A1 and B1 to do any farming or manual labor whatsoever. First fruits were restricted by the Germans when the head tax was imposed and private titles to land were issued, but both revived under the Japanese. Today feasts and first fruits are two of the most widely discussed native issues.

Hereditary and achieved rank.—Three groups are commonly distinguished in discussing rank in Ponape: the nobility, the sẹrĩso, and the commoners. The exact definitions of these groups are difficult to determine at the present time because informants use them

with reference to such obviously different groups. It is impossible to reconcile all their statements,[1] but the definitions used here are based on what seems to be the general usage of these terms.

The nobility (sōupēithi, sōupäithi) are those whose fathers and mothers are both noble and who belong, therefore, to one of the ruling subclans. They are the men who are eligible to become A1 or B1; their sisters are prevented from attaining these positions only by their sex. Their fathers are members of the opposite ruling subclans and both their fathers and mothers are noble by birth. In Kiti District, where the ruling subclans are paired, the highest ranking children of Clan 1 were formerly betrothed in infancy to the highest ranking children of Clan 2, so that the district chiefs would have wives of equally high birth. In Matälanim and Ü Districts, where men of several subclans were eligible to become B1, marriages were nevertheless arranged between the top-ranking members of these subclans and that from which A1 was chosen. As a result the nobility were members of one of the ruling subclans and more or less directly related through both parents to those who have held the titles of A1 and B1. Their relative hereditary rank depended upon the closeness of these relationships.

The sẹrïso (Children of ïsō) are those who inherit noble blood through only one parent. They are children of marriages between nobles and commoners, and are sometimes known as ïsō Nänmäriki and ïsō Nänikẹn depending on whether their noble blood came from members of the subclan from which A1 or B1 could be chosen. Usually noble blood was kept within the ruling subclan through infant betrothal.

The common people (aramas mwāl) are those who have no noble blood at all. All three groups seem to be based on hereditary rather than achieved rank.

A number of opportunities for higher status were open to the commoners which raised them above their hereditary rank. Stewards, who were given individual titles, were chosen from any of the three groups for their loyalty, reliability, and usefulness. Commoners could also be chosen as sections chiefs or to fill some of the numerous minor district titles below A12 and B12. The rank of commoners was raised if they married nobles or when they became secondary wives (pạkại) of the chiefs.

The personal servants (lïthu and läthu), who were chosen from the commoners, also ranked above the commoners and not below them, as Hambruch, Yanaihara, and others have stated. It is therefore misleading to refer to them as "slaves." Their status was not hereditary and their work was no more menial than that of the ordinary husband or wife. They had little freedom to do as they wished because their rank was so much lower than that of the chief's family, in whose household they worked, but in this respect they were little different from the commoners who married nobles or who were taken as the chief's secondary wives. A woman commoner had no choice if a noble man wanted to marry her; he simply sent his sister or servant to pour oil on her head and lead her to his house. Usually she went crying because she knew that her days of freedom were over and felt that her future life would be comparable to living in jail.

[1]Chief B1 of Kiti, for example, stated that there were only two real members of the nobility, A1 and B1; and that all others with noble blood were sẹrïso, including the sisters of A1 and and the men who were eligible to become A1 and B1.

The term mōnsap is sometimes also used in discussing rank. This is a contraction of "First of the Land" (mōwọ ẹn sap) referring to the first fruits which are given to the chiefs. Informants disagreed as to the groups to whom this term is applied; B1 of Kiti said that it means A1 and B1, the two chiefs who receive the first fruits, thus being synonymous with his definition of the nobility; while B1 of Ü said it means the section chiefs, who bring the first fruits. According to either interpretation, it is a group which ranks above the commoners; but it does not mean the nobility and sẹrïso combined, as Hambruch indicates. Gulick gives it as a synonym for the nobility.

With few exceptions, women are not permitted to become district chiefs because of their sex, even though they may qualify by birth. A woman's rank is dependent upon her birth and upon the status achieved by her husband. Noble women were normally married to men of comparable hereditary rank and assumed a feminine title derived from that of their husband, ranking just below him. There were special titles for the wives of each of the district chiefs A1-A12 and B1-B12, provided they had been taken in "real marriage" and not "common marriage." The rank of children, however, was independent of the achieved status of their father, and was determined solely by the hereditary rank of their parents until they had achieved a status of their own.

The children of A1 and B1 by secondary wives (pạkại) and by female servants (lïthu) were sẹrïso. The children of A1 or B1 by the principal wife (ïnanmōth) were nobles if they were born before the father had assumed office. If they were born after the father had been made A1 or B1, they were of higher rank and might even have a higher hereditary rank than either of their parents. Such children were known as those "born on the ditch" (ïpwin pōn warawar), referring to the concept of wäu, the "valley," which separated them from the rest of society.

Noble women who married commoners and noble men who took commoners as their first wives also had special status. They were known as "Fruits of Carelessness" (wän ẹn mwamäliki) and had almost complete sexual freedom so long as they did not violate the taboo against clan incest. They were also permitted to ignore the forms of courtesy toward the chiefs, and did not have to behave quietly in the chief's presence, lengthen the vowels in greeting the chiefs, or bow down before them and keep their distance from them. Such marriages were "common" and not "real marriages"; the children were sẹrïso.

If a daughter of A1, for example, married a commoner she was free to sleep as she pleased with either married or unmarried men. Neither her husband nor the wife of the man she chose could complain, and others were forbidden to criticize or discuss her love affairs. The rank of her husband would be raised by giving him one of the lower district titles within the range B3-B12, so as to maintain his wife's social standing. Her husband was not, however, accepted as a "real" noble, and his main function was to fish, farm, and cook for his wife. Her children might be members of a ruling subclan, but they were not nobles and could never become A1 or B1. A noble man whose first wife was a commoner had comparable sexual freedom and his wife also ranked below the "real" nobility and above the commoners.

Some of the disagreement about rank and the composition of groups based on rank seems to be due to

the differences of opinion as to whether a commoner who holds a district title is or is not a member of the nobility and as to his rank with respect to those who are nobles by birth. The term sǫupēithi is often loosely used to mean all the district chiefs (A1-A12 and B1-B12), or all the members of the clan from which A1 or B1 is chosen, and informants frequently attempt to distinguish between the "real" nobility (as defined above), the "lesser" nobility, and those who are "almost" noble. Relative rank within the nobility is distinguished both on the basis of the statuses which individuals have achieved and on their hereditary rank, which varies with how directly they can trace relationship to those who hold or have held the titles of A1 and B1.

In the old days the members of the nobility and serīso were generally given titles appropriate to their hereditary rank so that the achieved status of individuals of high birth was actually higher than others. There were exceptions, however, such as the titles given to a commoner who married a noble woman which gave him a higher position in the seating arrangement at feasts than some of the serīso and lesser nobility. Section chiefs also occupied the position of A1 when A1 was absent from section feasts, and took precedence over district chiefs (A2-A12, B2-B12) who happened to reside in his section.

It is possible that in earlier times the boundaries of the three groups may have been more clearly defined than at present. It seems more likely, however, that achieved status has always been more important in determining the seating arrangements and other forms of showing deference and respect than birth into one of the three classes. In other words it may be more accurate to picture rank in Ponape, except perhaps among the commoners, more or less as a continuum, within which the individual's position depended on both his hereditary and achieved status, rather than as discrete and clearly separated hereditary classes whose relative position determined the rank of all their members.

Birth into these classes sets certain limits above which an individual cannot advance in the social scale and below which he cannot fall, but within these limits there was competition with the others who were eligible to achieve the same positions. As has been indicated, an increasing number of district chiefs appointed in recent times have not been noble or members of the proper subclan. This has meant a broadening of the competition for these positions and a raising of the goals that may be attained by those who are not nobles. Although the normal pattern of succession to district titles is one of regular promotion, this can be disregarded and anyone who is eligible by birth may be promoted or appointed to fill a vacant post. Competition, therefore, continues among those who already hold titles.

Prestige competition.—Competition centers about the feast (kamatipw) which is in some ways comparable to the potlatch of the American Indians of the Northwest Coast, and in which yams (kǭp) and pit breadfruit (mār) are not unlike the Northwest Coast "coppers" in their function. These feasts occur mainly during the season of yam harvest, after yams have been given to the chiefs as first fruits.

When a section feast is given, the head of each household or farmstead contributes a yam, and perhaps other food as well. Everyone present examines and compares the yams which are brought to the feast-house, and praises the largest yam for its size and quality. Each person in turn goes up to the man who in his opinion brought the best yam to tell him that he is "Number One." The commoners praise him for his skill and ability as a farmer; the chief praises him for his generosity.

The section chief watches to see which men are consistently bringing the largest yams, and chooses them to fill section titles which are vacant or promotes them to higher rank if they already have a title. When the section chief is not present at a feast, his people tell him whose yam was largest. The section chief also reports to the district chief (B1 or A1), so that a man who consistently brings large yams may be appointed to fill vacant district titles. Success in competition may thus win actual status as well as prestige and praise.

Success in this competition is evidence not only of a man's ability, industry, and generosity, but also of his love and respect for his superiors. The latter is most important as a qualification for holding a title in the eyes of the section chief and of A1 and B1, who appoint and promote those beneath them. Devotion to the chiefs can be shown in other ways as well, and occasionally individuals are rewarded with titles for special favors shown to the chiefs or generosity that has taken other forms. But the standard and accepted pattern through which generosity and devotion are formally expressed is the giving of feasts in honor of the chiefs and contributing the largest yam at feasts given by others.

No large feast can be given without kava and a pig. These are provided by the host who receives the credit and prestige for having given the feast. When the district chief is given a feast by a section, all its members share the credit including the section chief, who must provide the first pig and the first kava plant. If a large feast is to be given, the members of the section discuss the matter beforehand, and each one offers to bring what he can afford. If more than one pig and kava plant are needed, members of the section who have the most of these volunteer to contribute them, and their generosity is also noted. The size of a pig, the length of its tusks, and the number of kava plants consumed at a feast bring prestige to the host and donor. These contributions, however, do not seem to play so large a part in the formalized competition for prestige as do the largest yam or the giving of a feast. An individual who gives a feast for a guest likewise provides at least the first pig and kava plant. All his neighbors who wish to honor the guest, and all friends who wish to help the host, contribute yams and other food.

Pit breadfruit (mār) are also important contributions. They are not as commonly used at feasts as yams, which seem to be the basis of active and continuing competition, but they count heavily when they are presented. At some feasts only one or two persons bring pit breadfruit, and at many none is brought at all. It is only if an exceptionally large feast is arranged that the members of a section agree that each person is to bring a mār.

The rules of competition are artificial and arbitrary as far as any standards of generosity are concerned. Contributions of fresh breadfruit, taro, bananas, pineapple, drinking coconuts, and other foods do not count. It is the size of the yam and not the quantity that is important. A man cannot win prestige by bringing a large number of small yams. Each yam, furthermore,

can have only a single vine; if there are two vines it is regarded as two separate yams. Certain yams grow in bunches which are attached together at the top below the vine; if there is only one vine the whole bunch counts as one large yam. Other varieties, which have a single vine but take the form of groups of small round unattached yams, count as separate yams.

In contributions of pit breadfruit, which are at least four feet thick and six feet in diameter, the age of the pit is more important than its size. Pit breadfruit is not brought to a feast until it is at least ten years old. When it arrives, everyone asks the owner how old it is, and praises him for having kept it so long without having used it. Portions of the mär may be taken out of the pit and used for subsistence. A pit which has been depleted through use in this way can be replenished by adding fresh breadfruit to it, the date of the mär for competition purposes being taken from the age of the oldest portion, like that of blended whiskey. In order to count in competition, however, the pit must be emptied. A portion of a mär that is cut off and brought to a feast counts for no more than a contribution of bananas or fresh breadfruit. The entire mär, leaves and all, is taken out of the pit and carried to the feast house slung in its "nest" (päs) between two poles, with from four to twenty men carrying it.

However much a man may enjoy being the center of attention, and however much pleasure and personal satisfaction he may derive from the praise he receives from all sides when he produces a very large yam or contributes a very old pit breadfruit, or when he discovers a new variety of yam, he must conform to the Ponapean pattern of modesty. He must not show his pleasure unduly, or act proudly, or boast openly about his achievement. He pretends not to listen to the comments that are being made about his yam and when others come up to him to tell him that his yam is the largest. He usually protests that it really isn't the largest, and points to the next largest yam claiming it is better than his own. He goes over to the owner of this yam and tells him that he is "Number One"; the latter of course also protests. A man who shows his pride openly will be called proud and pretentious. He is talked about and laughed at, so that the prestige that he has won is turned to shame.

In prestige competition, this pattern of modesty is enforced not only by fear of being ridiculed for pretentious behavior, but also by fear of being shown up in the future. The man who is acclaimed "Number One" does not dare to ridicule or laugh at the man with the second largest yam, or even at the man who has brought the smallest one, for fear that they may bring a larger one than his at the next feast. The assumption is that no one ever brings his largest yam or his oldest breadfruit to a feast, but keeps them in reserve in case someone challenges him. A man who is challenged may actually bring a number of very large yams to the following feast and demand publicly of his challenger "So you said I couldn't grow any large yams," and if the challenger has not brought larger yams himself, he is badly shamed. A comment which is commonly made to a man who has brought a pit breadfruit to a feast, while praising him for what he has done, is "And what about the other one?," referring to the one which is kept in reserve and which is certain to be even older than the one he has brought.

Prestige competition is a factor fundamental to the Ponapean's motivations and his attitudes toward work. These motivations cannot be explained simply in terms of a desire to purchase certain imported items and to produce enough food to keep himself and his family from hunger. Not infrequently families go hungry at home when they have large yams in their farms. Large yams are never used at home for subsistence. They are saved until there is a feast when others can see how large they are. The Ponapean's love for his farmstead and his reluctance to leave his own land to seek wage labor cannot be fully understood without appreciating the social importance attached to yams.

Yam growing is a secret matter. As we have indicated, a Ponapean may speak openly about the number of coconut trees or the amount of money he has, or even boast about them; but his answers to questions about the number and the kind of yams he has planted are evasive and often deliberately falsified. He conceals this information so that he may surprise others when he produces his yams at a feast, in the hope that he may be able to surpass them. If he answers such questions, he will say that he has planted only a few yams or none at all. In a way, such questions are comparable to those asked of an automobile manufacturer by a competitor about his production goals, the details of his next year's model, or other information generally regarded as trade secrets.

It is impolite to look at another man's yams, and anyone caught doing so will be shamed by gossip and ridicule. When visiting another man's farmstead a Ponapean pretends to ignore even the yams growing near the house, although yams planted so openly are for subsistence rather than for prestige competition. The best and largest yams are grown in parts of the farmstead which are as far away from the house and any paths as possible and often heavily overgrown with bush. For this reason the request of a foreigner to inspect a man's farmstead is an awkward and embarrassing one. A Ponapean caught trespassing in this part of a man's land is openly ridiculed.

A man also conceals the number and age of his pits of breadfruit as best he can and lies about their size. He may claim that only a few hundred breadfruit were used to fill a pit when actually the number was several thousand. Breadfruit pits are also hidden away in remote and inaccessible parts of the farmstead. Members of the household or clan, male and female, cooperate in making pit breadfruit, but the growing of the yams is an individual affair which men do by themselves.

Yam planting was formerly carried on in greater secrecy than football practice or spring training in the United States; a farmer got up at two or three in the morning and planted yams and tied the vines in the dark so that no one could see him. Only a few old men take this much trouble today, but yam planting is still secret. Although cooperative work groups have been very popular, they do not help a man with planting or harvesting yams or even with harvesting breadfruit since yams are planted under breadfruit trees. When Carlos Escheit was interned by the Japanese during the war he found that in spite of the urgency of his need for food for his family, he could not get his servants to grow yams in his yard because they did not want him to see how it was done.

The social importance of yams is reflected in the care and skill used in growing them and in the interest in yam varieties and knowledge of their characteristics and histories. Whereas fertilizer is used for taro throughout most of Micronesia, on Ponape it is used only for yams, and when yams are being grown for competition each step must be done correctly. One

informant was able to name ninety native varieties of yams without stopping. It is doubtful that many corn farmers in Iowa, wheat farmers in the Dakotas, or apple growers in Washington could do better with the crops on which they are economically dependent. Without beginning to exhaust the subject, one hundred fifty-six native varieties of yams were recorded, together with their size, shape, color, and the period when they first had been planted on Ponape. For many of the varieties informants were able to name the man who had first planted them and the district and section in which this was done. Bananas, to which no prestige is attached, present a striking contrast. In spite of the fact that all the older native varieties of bananas have been rendered practically useless by the recent introduction of a root borer, and although all three of the borer-resistant varieties used by everyone today were introduced recently, during the Japanese period, the informants questioned could not name any of the men who introduced them.

The appearance of a new variety of yam is an important event, and when one is brought to a feast for the first time there is great excitement. Everyone gathers about it to examine its shape, its color, and its skin texture, and to judge its size in hopes they may raise a larger one of the same variety later on. They also gather about the man who brought it, asking him what its name is, what kind of a vine it has, what it tastes like, when he planted it, how long it takes to grow, and to try to buy seed cuttings from him. The man, in turn, is proud and pleased because of the interest shown in his yam and because people want to plant it. He gains more prestige than the man who brought the largest yam to the feast. As the news spreads, people from all parts of the island come to him to ask for seeds, hoping to be the first to introduce it to their own district.

A man who discovers a new variety of yam has the privilege of naming it. If it is a good variety of which he can be proud, he usually gives it his own name. Whatever he decides to name it, he is known as the man who introduced it, wherever he goes, and when he is a guest at a feast in which the largest yam is one of his own variety, he receives more praise and personal satisfaction than the man who actually grew it.

A new variety of yam is not immediately presented at a feast. One variety (Nāliklapalap), which had been given to Chief A7 of Kiti District by Mr. Grey, an American missionary, in the early part of the German period, was not introduced publicly until the Japanese period, at the very least seven years later. A man who finds or introduces a new variety always waits several years until he has grown about a hundred yams from it, because he would be ashamed if he did not have enough to satisfy the demands of all the people who wanted cuttings to plant.

He plants the new variety in the most secret parts of his farmstead and in the meantime he may let the news of his discovery be known so that the people may speculate about it. Word of this kind spreads rapidly over the whole island, and everyone is discussing the new yam years before it is shown to anyone. An announcement of the discovery of a new variety of yam, which had not yet been introduced or given a name, was made in my presence this summer by a chief (A9) of Kiti District. Although it was made in a casual and offhand manner in keeping with the Ponape pattern of modesty, it was apparent that the chief was concealing his pleasure and satisfaction with difficulty.

WEALTH

In recent times another system of prestige has developed, based on the ownership of wealth. In the native period certain types of clothing and large and specially built houses were associated with social status, but they were restricted to the chiefs. These restrictions can no longer be enforced and through contact a number of new types of property have been introduced. Money, the number of coconut trees owned (which is an indication of income), European houses, European clothes, personal ornaments, furniture, dishes, books, boats, canoes, and perfumes are the "counters" or "chips" used in this new system of prestige, rather than the size of yams, the age of pit breadfruit, or the clan affiliation or hereditary rank of a man's parents.

Before the period of wartime shortages, people who did not have good clothes were ridiculed and laughed at. The wealthier families all had large sets of china, glassware, and good furniture. Most people spent as much as they could afford on clothes and these other items, but some preferred to save and accumulate money. They might own 300 yen or 6,000 yen and yet not own dishes or pots and go about without a shirt; those who were better dressed did not laugh at them unless they themselves had more money. This system of prestige is comparable to that in our own society, though it is given a slightly different flavor by the pattern of modesty. It may not be as directly related to social status in terms of chieftainship as is feasting, but the wealthiest individuals generally hold titles today.

The wealthiest family on Ponape were the Nānipēi's, who have inherited the fortune accumulated by their father Henry Nānipēi. They owned about 37 per cent of the native-owned bearing coconut trees on Ponape, including Ant and Pakin, and perhaps 25 per cent of the total number including the former Japanese plantations, but their cash holdings had been wiped out by the regulations governing the exchange of yen. Henry Nānipēi's father was the Nānikẹn (B1) of Kiti District. His hospitality to Americans and Europeans was famous among the whalers and traders, and many sailors jumped ship in the early days to live as his guest. The results of these sojourns are still apparent in Kiti District in the number of people with mixed blood.

In return for his hospitality, one of his English guests gave the Nānikẹn a piece of paper when he left. He explained to the Nānikẹn that, although he could not read or understand what it meant, he should keep the paper because it would some day be very valuable to him. It later turned out to be an agreement under which full rights to a large tract of land were assigned to the Nānikẹn and his heirs by the native occupants, and it was honored by the Germans when private titles were issued to the land.

When the Nānikẹn died, his son, Henry Nānipēi, continued his father's tradition of hospitality to visiting foreigners. He started the first Ponapean-owned store, using the money, cloth, liquor, and other gifts he and his father had received from the visiting ships. He also planted coconuts on the land inherited from his father and on additional land that he acquired himself. In this way he became the largest Ponapean landholder, copra producer, and trader on the island, and Ponape's wealthiest and most distinguished citizen. He visited Germany and America and sent his eldest son, Oliver, to the Kamehameha School in Honolulu. After his death, 3,000 people gathered to see the Japanese erect the

bronze statue which still stands in his memory at the site of his former home in Section K19. Oliver Nänipēi succeeded his father as the wealthiest Ponapean, although in theory he held the property in the name of all Henry's children. Oliver held his father's title, Nänipēi (A6), in both Kiti and Ŭ districts, and another son, Thomas, held the same title in Matālanim District.

COMPREHENSIVE ORGANIZATION

Ponapean legends refer to a period when the whole island was united under a single ruler, whose title was Säuthęleur. A succession of individuals bearing this title ruled Ponape from the artificial islands at Näniwēi (M27), where the archaeological ruins are located. Their reign was brought to an end by an invading party from Kusaie which defeated and killed the last Säuthęleur, and whose leader set himself up as the first Nänmāriki (A1) of Matālanim District. Since this period in the remote legendary past there has been no single chief for the entire island.

Neither the Spanish, nor the Germans, nor the Japanese made any attempt to unite the districts politically. The first step in this direction was the initiation of a series of monthly meetings of the district chiefs and representatives by Military Government to discuss problems pertaining to the island as a whole. The idea was conceived and executed in a highly commendable manner. Military Government representatives attended the meetings only to present certain problems for discussion, such as laws of inheritance and land tenure. Otherwise the meetings were left completely to the chiefs and representatives, who afterwards reported to the Military Government officer on what questions they had discussed and what conclusions they had reached. Each district in turn provided a representative who presided over the meeting. The first meetings were held on neutral ground at Military Government headquarters because of the early history of interdistrict wars, but the intention was to have the meetings at the various district offices in rotation, as soon as it was evident that there was no danger of friction.

Among the questions that were discussed at the monthly meetings were the codification and unification of native customary law, taxation, the maintainance of roads, district salaries, the standardization of Ponapean spelling, the development of schools, the production of copra and trochus, and import requirements. Although discussions sometimes became lost in trivial matters, like the trackmeet, and although decisions were often more quickly taken than acted on, the most outspoken critics of these weaknesses were some of the chiefs themselves. The interdistrict meetings were an admirable step in the direction of self-rule and met with a very favorable response on the part of both the chiefs and the people. Ponapeans were quick to comment on this difference in policy between the Americans and their earlier rulers.

In spite of the differences in dialect, religion, and other aspects of culture between the districts, Ponape has a basic cultural and linguistic unity. The people of Ponape distinguish between themselves, as a group, and the Micronesians from other parts of the Carolines and from the out-islanders who are now living on Ponape, to whom they refer by their island of origin. The out-islanders were brought to Ponape in 1912 after houses, coconut palms, and breadfruit trees on a number of the islands in the Carolines had been destroyed by a typhoon. They were settled on Sokȫs Island on land that had been expropriated from the exiles to Palau after the Kawäth clan war against the Germans in 1910. Other out-islanders have settled in Nęt District, just across from Sokȫs Island, and in Palikir. The out-islanders were issued private title to their land along with the Ponapeans. There has been no appreciable immigration to Ponape since this resettlement project, except for the Japanese, Okinawans, and Koreans who have now been evacuated.

In Sokȫs District, 210 out of the 274 inhabitants of Sections G and H were said to be Ponapeans. In all the rest of the district, that is, on the island of Sokȫs proper, there were only two Ponapean families, totaling 12 individuals, who lived in Section A. Of the Mortlocks, 232 lived in Section D, 178 in Section E, and 90 in Section C of Sokȫs District, plus perhaps 80 others without land who were scattered about the other districts as tenants and laborers. Of the Pingelap, 187 lived in Section B of Sokȫs District, with perhaps 3 in other districts. All 85 Ngatik were in Section F and all 80 Mokil in Section A of Sokȫs District. All 75 Kapingamarangi or Greenwich Islanders were in Section 20 of Nęt District, which sometimes was referred to as "Greenwich Village." Most of the Nukuoro were in Section 20 of Nęt District, with 3 living in Section A of Sokȫs District. Of the people from Yap, 57 lived in Section G of Sokȫs District, with perhaps 8 scattered in other districts.

According to Ponapean traditions, the original inhabitants of the offshore atolls of Ant (änth) and Pakin (pakēin), which for many years have been occupied only by out-islanders employed as wage laborers, had their own language. Kusaie (kȫtȩ, kȫtȩpäitha), like Ponape, is regarded as having had its own culture since the remote legendary period. Except for these islands, the only places mentioned in Ponapean legends are lap, which the Ponapeans identify as Yap, and Sapäni, which they identify as Japan. Many items, supposedly introduced before European contact, are said to have come from Yap. One of the women's names on Ponape, said to be very old, is lipōnsapäni, which is translated as "Woman on Japan." Ponapean traditions tell how people coming from the west first piled up rocks on a reef to build the island of Ponape, which literally means "On the Rocks" (pōnipēi).

Of the closer nearby islands, there is said to have been no knowledge until the arrival of trading and whaling vessels from Europe and America. It was not until after contact that the Ponapeans learned of Mokil (mwȫkil) and Pingelap (pingilap), which they say were settled from the Marshalls; of Nukuoro (nükuȩr) and Kapingamarangi (kąpinmäilang, which means "Under the far distant sky"), whose inhabitants speak a Polynesian language; or of Ngatik (ngatik), which they say was settled by Ponapeans. Similarly it was not until after contact that they learned about Oroluk (wȩtȫluk), Truk (rük), the Mortlocks (mȩtilȫk), Palau (pälau), Saipan (saipän), Guam (küam), the Marshalls, and the Gilberts.

Except for the Ngatik, whom they regard as historically, culturally and linguistically related, the Ponapeans hold themselves to be distinct from their neighbors. Relations with the out-islanders who have settled on Ponape have been cordial, and in their present number they present no problem. Many Ponapeans even prefer them to the native people of Sokȫs, who are regarded as proud and arrogant. Curiously, of all the out-islanders, the Ngatik are the least liked.

Ponapeans recognize that the out-islanders have special skills and aptitudes that complement those of the Ponapeans, to their mutual benefit. The people of Mokil and Kapingamarangi are deep-sea fishermen by tradition, whereas Ponapean fishing is confined to the reefs. The people of Yap still use fish weirs and traps, which have been abandoned by the Ponapeans. The Mortlocks are recognized as the ablest navigators on Ponape, as well as the most desirable employees for steady common labor. The people of Mokil are known for their skill in making hats and their other handicrafts, and for their ability in boat building and house building. The only man capable of operating the hydroelectric plant was from Palau, and another Palau man was known as the best harbor pilot and operated the only blacksmith shop on Ponape. A man from Saipan knew the essentials of both shoe repairing and beekeeping.

Whether these special skills are the result of differences in their cultural heritage or of their varied educational opportunities, they are one of the real economic assets of Ponape both for the present and for the future. Under these circumstances there is no justification for raising the question of repatriating the out-islanders. With a few rare individual exceptions, they have no desire to return to the overcrowded and less fertile islands from which they came. They have made Ponape their home, and as individuals they own no land on the islands where they formerly lived.

The Belgian population of Ponape consisted of the families of two brothers, Leo Etscheit and his wife and Carlos Etscheit and his wife and three daughters. Their father bought the plantation of Kubary, the famous representative of the Godeffroy Company, and it is now owned by their mother in Belgium. The plantation, which was heavily damaged during the war, was managed by Leo, who also was active in the import business. Carlos, who was born on Ponape, had managed the Catholic plantation in Matālanim District (M20) for a number of years, owned stores in Matālanim and Kiti districts, operated a modern oil press, and manufactured soap for local consumption. Both families were interned on Ponape by the Japanese during the war.

JAPANESE ECONOMIC DEVELOPMENT

The Japanese community engaged in a variety of economic activities before World War II. Nambo (nämpo), or the South Seas Trading Company (Nanyo Boeki Kaisha), was primarily interested in the import trade and in copra, and from 1914 until about 1935 it dominated the entire economic picture. It developed two copra plantations, one in Matālanim District and one on Pakin Island. Kohatsu, or the South Seas Development Company (Nanyo Kohatsu Kabushiki Kaisha), started growing cassava on a large plantation in Matālanim District in 1934 but shifted in 1937-38 to sugar cane from which they manufactured alcohol for export to Japan. A subsidiary, Nankosuesan, was established for bonito fishing and ice manufacture. Kohatsu, which controlled the sugar industry in Saipan since its establishment in 1921, was large enough to be a threat to Nambo's dominant position, and a rivalry developed which lead to the rapid expansion of both plantations to claim the unoccupied land lying between them. With Nambo in the south behind Sections M18, M19, and M20, and Kohatsu starting in Sections M8 and M10 in the north and extending behind Sections M12, M13, and M14, Matālanim harbor was rapidly being encircled. From an economic point of view Matālanim became in some ways the most important part of the island, and the Japanese town of Sapalap became almost as large as the Colony. About 1942 the two companies were merged by order of the Japanese government, continuing under the name of Kohatsu but with most of the personnel of Nambo.

Nanten, which operated the hydroelectric plant, was financially affiliated with Nansan, the South Seas Industry Company (Nanyo Sangyo Kaisha), which established the large sawmill near the Colony about 1935, and they were described as one company operating with separate accounts. They shared the same offices until they merged completely into Nanyo Kinyo, a subsidiary of a large Japanese trading and cotton-manufacturing firm, Toyo Boseki Kaisha, of Osaka. They became interested in real estate on Ponape and attempted to buy the Etscheit plantation to develop as a subdivision of the Colony.

Nantaku, the South Seas Exploitation Company or the South Seas Industrial Research Company (Nanyo Takushoku Kaisha), which was founded by former government officials, followed shortly after Kohatsu. Their first interest on Ponape was sisal, but they soon shifted to pineapple. Later they set up a subsidiary company to can pineapple, Nanyo Ori, which is also said to have experimented with canned breadfruit, mangoes, turtle meat, and shellfish. The programs of both companies were interrupted by the war, when they shifted to growing fresh vegetables.

Wakamoto, a branch of a large Japanese drug company of the same name, came to buy uşel ẹn thõng and medicinal plants. During the war this company also shifted to vegetables, particularly cassava.

Kaiesha Kaisha set up the first ice plant on Ponape, selling ice to private homes. The company was formed by the head of a religious group, and was originally interested in coconut production. They abandoned coconuts and for a time were operating their ice plant and a small sawmill in the Colony, and producing sugar. They later abandoned their ice plant when Nankosuesan put up a better one, and were forced to give up sugar planting when their land was requisitioned for military purposes.

Tong Kaisha, the Thõng Company, began shipping thõng wood to Japan for the manufacture of gẹta shoes or rayon about 1937, and during the war several companies engaged in this trade.

Kalau Kaisha, the Hibiscus Company, began about the same time to export hibiscus bast and again several others entered the field during the war. The export of hibiscus bast was one of the earliest commercial ventures on Ponape, an attempt having been made about 1926 which failed. Some of the original people stayed on in other business, until the Sino-Japanese war made hibiscus profitable, when some of those who had left returned.

Nano Aruminyumu Kogyo Kaisha, the South Seas Aluminum Mining Company, did no more than prospect for bauxite and gold on Ponape. They rented a house in the Colony and set up a small laboratory for six or eight months in 1937 or 1938.

Nankosuesan, a subsidiary of Kohatsu, established a refrigerating plant and fishing company to compete with the several small Okinawan companies that had established bonito fishing on Ponape as early as 1934. They also became the largest supplier of ice for home use.

Nankosha began about 1938 to produce desiccated copra in a small factory for export to Japan for candy making. This was discontinued during the war, when

they began to export coir and to produce copra oil. When Carlos Etscheit was interned, this company took his press and later imported another from Japan. During the war several different companies and individuals exported coir.

Nanyo Pulp, the Pulp Company, began to produce paper pulp and manufacture paper on Ponape in about 1939. Two plants were introduced for producing pulp both of which are known by their Japanese names today. Pokao or "Napir grass" (Pennisitum) produced a rather poor quality paper that was used for newsprint, and Koma (unidentified) gave a better grade of paper. The bark of the local nïn (Ficus tinctoria) plant was also used, at least experimentally, and is said to have produced a good grade of paper. During the war this company supplied most of the paper used on Ponape but the lack of shipping interfered with its plans for export, if any. The factory, which was destroyed, and the farms were situated in Palikir.

Nambo Tannin, the South Seas Tannin Trading Company began about 1939 or 1940 to export mangrove bark to Japan. It may have been a subsidiary of Nambo, but its operations and personnel were separate. During the war, like many other companies, it began producing coconut oil and soap.

A man, Okiyama, combined pig farming with the making of a Japanese dish called tofu. The tofu was made of starch from a special kind of bean, the remainder being used as pig feed. During the war he bought out another Japanese businessman and began to make soap. He was the first to manufacture soap after Carlos Etscheit was interned.

Other Japanese activities included the manufacture of cigarettes, the weaving of cloth, the manufacture of buttons from ivory nuts, boat building, and the production of salt, geta shoes, charcoal, molasses, and a liquor known as shochu, in addition to many forms of agriculture.

The Colony had electric lights, telephones, seven shops selling ice cakes or ice sticks, seven bakeries, more than twenty restaurants where a full meal of rice and fish could be bought for 15 sen (4 cents), a dairy, a slaughterhouse, a pharmacy, and more than fifteen dispensers of patent medicines, in addition to barber shops, laundries, second-hand stores, curio shops, butcher shops, and licensed liquor dealers.

4. CONSUMPTION

PONAPEAN CONSUMPTION PATTERNS

Ponape had a self-sufficient economy before European contact. Micronesians from nearby atolls may occasionally have visited Ponape for trading purposes, but their contribution to the economic life of Ponape was small and almost exclusively in the field of luxury items. At least in recent years, the only items imported from neighboring islands have been those which were also produced on Ponape, such as pandanus and coconut hats, mats, and bags, but which were of higher quality or different in design or technique of manufacture. The Ponapeans themselves were not a seafaring people. Their island produced sufficient foodstuffs and materials for handicraft so that there was little incentive for trade with neighboring islands. In the early days, Ponapeans did not undertake the long ocean trading voyages and did not even venture out beyond the reef for deep-sea fishing as did other Micronesians.

As a result of contact with the outside world, however, Ponape has come to be dependent upon imported goods. Largely through the deliberate efforts of the missionaries, cotton clothing of foreign design was universally adopted. Traditional forms of clothing were laughed at by the Ponapeans themselves, and except for the men's skirt their method of manufacture has been forgotten. The techniques of weaving and of making bark cloth and sails have been lost. Matches were used instead of the fire-plow, and with only one or two exceptions, metal tools replaced those of shell and stone. Imported sheet metal was used universally for dwellings instead of thatch, and a Western-style cottage requiring nails and sawn wooden planks replaced the Ponapean house. Sawmill equipment, engine-driven boats, refrigerators, telephones, electric lights, electric generators, and other mechanical equipment were introduced, and the Ponapeans have become dependent on these in varying degree.

New tastes in food were acquired. A number of new plants including mangoes, papaya, guava, pineapple, corn, cassava, sweet potatoes, pumpkins, watermelons, onions, and chili pepper were introduced into the Ponapean economy and are produced locally in sufficient quantity to supply the present needs. Other new items such as tobacco, salt, sugar, tea, rice, wheat flour, milk, and beef, are not produced locally in adequate quantity and must be imported.

Unless the Ponapeans are to be forced to accept a markedly lower standard of living, imports will have to continue. Some of the imported goods such as metal tools cannot be produced locally because of the lack of resources; others, such as cotton cloth, could be produced in time, but probably not on a sound economic basis. Some, such as sugar, might offer opportunities for future development, but would probably require both a larger market than Ponape at present affords and a shift from an economy based on independent farmsteads to a plantation system and wage labor.

FOOD, BEVERAGES, AND STIMULANTS

The basic item in the Ponape diet is a starchy fruit or vegetable. This constitutes the bulk of each meal, but no meal is considered complete without sāli, a term used for a protein dish of meat, fowl, fish, or other kinds of seafood. When none of these proteins are available, a sauce of chili pepper and salt may be used as sāli. The starch and the protein dishes are never mixed. They are cooked separately and served on separate leaves or plates. Fruit and to a lesser extent green vegetables supplement this diet, but these are not served with the two main dishes. In recent times the European custom of serving a variety of dishes has been adopted under certain circumstances. At some feasts, and at home when entertaining company, baked yams, boiled yams, fried yams, baked breadfruit in two forms, boiled breadfruit, fried breadfruit, fried bananas, boiled crab, fried fish, fried pork, baked pork, and soup, or various combinations of these dishes may be offered at the same meal. The old pattern of limiting the meal to a single starch dish and a single protein dish is followed when the family is eating by itself, except in a few of the most acculturated families. Women, Ponapeans say, eat more than men.

Breadfruit and yams are the most important of the starch foods (see chapters 8 and 9). With adequate fertile soil, coconuts, taro, arrowroot, pandanus, and other staple crops of the coral atolls have been relegated to positions of secondary or minor importance. Breadfruit is important on the other volcanic islands of the area such as Truk and Kusaie, but it is doubtful that anywhere in Micronesia yams have assumed so prominent a position in the diet or in the social life as they have on Ponape.

In the mind of the Ponapeans, the year divides itself into two food seasons, that in which fresh breadfruit is eaten and that in which yams are eaten. This division is an idealization that is at least in part fictional. The most that can be said is that breadfruit is generally associated with the rainy and humid seasons and is most plentiful about July and August, whereas yams are associated with the trade winds and are harvested in great numbers about December and January. In actual fact yams and breadfruit can be eaten at the same time during a large part of the year.

The time at which breadfruit matures depends upon the variety and varies from one year to the next and from one part of the island to another. In one part of Matālanim District it is said that fresh breadfruit is available all year long. By planting both early and late varieties of breadfruit, and by picking late varieties of breadfruit that grow wild in the mountains after the planted trees have been harvested, it is possible to eat fresh breadfruit at least occasionally throughout most of the year (from May to February) in most parts of the island. The season at which yams mature also depends on the variety, the year, their location on the island, and on the time of planting as well. A careful farmer, by selecting the proper proportions of early and late varieties and choosing the correct time for

planting, can have yams for feasts at any time of year, although it may be necessary to harvest some before they have grown to full size.

For most families, however, there are two between-season periods each year when neither yams nor fresh breadfruit are available in sufficient quantities to serve them regularly. These periods fall about April-May, after most yams have sprouted and are no longer available and before the full breadfruit season (räk) has begun, and about October-November when breadfruit has become scarce and before the season (ĭsọl) when yams are fully mature and are harvested. They do not constitute serious hunger periods since a number of other starchy foods are used as substitutes for yams and breadfruit at these times.

These substitutes, in order of preference and their frequency of use before the war, are Alocasia, "Western Yams," Cyrtosperma, taro, "Hawaiian taro," cooked bananas and plantains, pumpkins or squash, cassava, sweet potatoes, and last, and least frequently used, arrowroot. During the war large quantities of sweet potatoes and cassava were grown by the Japanese on Ponape, as a result of which their popularity has increased. It was expected that, when farming was resumed on a peacetime basis, the order of the last four substitutes might be sweet potatoes, cassava, pumpkins, and arrowroot. All four are of minor importance compared with bananas and the other plants that rank above them. Pit breadfruit, breadfruit seeds, and imported rice are also used as substitutes for fresh breadfruit and yams.

These substitutes are occasionally eaten when yams and breadfruit are available. This is done more often during the yam season, to stretch out the yams that have been planted, than it is in the breadfruit season, when most families have more breadfruit than they can consume. There is little desire for variety in food. Ponapeans are willing to eat breadfruit or yams, and particularly the latter, meal after meal and day after day.

Coconuts are used mainly as a cooking ingredient. Cream from the grated meat is squeezed over starch or protein dishes, and coconut oil is used in frying. Coconuts are less important in the Ponapean diet than on the neighboring atolls and are thought of more as a drink than as a food. Grated coconut is mixed only with pit breadfruit, and coconut meat and coconut husks are eaten only between and after meals and never serve as a substitute for yams or breadfruit. The juice of drinking coconuts and the boiled juice of ripe coconuts may be drunk either with or between meals. Turmeric is also used primarily as a cooking ingredient, but it is less important today than chili pepper, lemon, and salt, all of which are new since contact. The leaves and vines of certain plants are infrequently used in seasoning other dishes.

A large number of fruits and some fresh vegetables and nuts are eaten only after or between meals and never form a part of the meal itself. Although they make an important contribution to the diet, they are not regarded as "real food" or nourishment. Some of these may be brought home from the farm and kept in the house ready for use when needed; some are planted just outside the houses, where they are readily available and are picked as they are needed; a number, which the Ponapeans speak of as being eaten only "in play," are never brought home but may be picked and eaten when one happens to pass the place where they are growing. Those eaten only in passing include guava, lime, "Jamboo apple," onions, "almond," cacao, a kind of palm cabbage, and several unidentified plants.

In addition to the forty-two plants used for food today, there are a number said to have been used as food in earlier times. Among these are the fruit of Morinda citrifolia (wĕipwul), which is said to be eaten by the people of Truk and the Mortlocks today; the yellow berries of Ficus tinctoria (nĭn); the nuts of a tree (karara), which Christian identifies as a wild nutmeg, Myristica, and which, according to him, were chewed in olden times to make the teeth red, a statement that could not be confirmed by informants; an unidentified tree (kĕmä) that according to a Ponapean manuscript provided food in the old days but this likewise could not be confirmed. All these plants grow wild and are never cultivated, and only one variety of each is recognized. The nut of the Cerebra (kithi) is regarded as poisonous and is never eaten; but Ngatik informants stated that on their island its white meat is eaten without ill effects, although the skin and shell are deadly poisonous. According to legends Morinda citrifolia was the first food on Ponape. It and Alocasia were the only two foods available when the first canoe-load arrived and the island had first been created. After the third voyage, Ficus tinctoria, arrowroot, palai, Cyrtosperma, and taro had been added.

Of the early foods that are not ordinarily eaten today, Ficus tinctoria and perhaps Morinda citrifolia may be used as foods following a typhoon; banana stalks may also be eaten. Even severe typhoons do not cause real famine on Ponape. During the one in 1905, people ate Cyrtosperma, Alocasia, yams, "Western yams," and pit breadfruit in addition to the foods listed above; these foods constitute an important reserve against times of hardship since they are not destroyed by storms. Houses, coconut and breadfruit trees, and papaya were destroyed, but papaya grew up again rapidly and was soon available once more.

During the period between the harvests of breadfruit and yams, actual hunger is only occasionally experienced, more frequently on the northern side of the island where there is less wet soil for growing Alocasia and Cyrtosperma and where the landless people are concentrated, than in Kiti or Matälanim districts. By providing a staple food between the yearly breadfruit harvests, yams fill in what is a hunger period on Truk and other Micronesian islands.

The consumption of protein foods is related to the cycles of the tide (ŭ, or sometimes wĕth). The highest and lowest tides come two weeks apart on the nights of full moon and new moon. According to Ponapean fishermen, there are marked high tides (ŭlọl, wĕth) and low tides (ngalangal) for several days before and after these two nights, and in between there is a period of about a week or less when the depth of the water is intermediate and shows very little variation throughout the day. This gives a week of high and low tides (with full moon in the middle of the period) followed by a week with little variation, and then a week of high and low tides (with new moon in the middle of the period) followed by another week with little variation. Ponapeans refer to the period with little variation as that of "whole tide" (ŭąpwon) or "crooked tide" (ŭąkos) when the tide's "mind is not straight" and it "cannot decide" to be either high or low; and to the period of marked variation as that of "low tide" (ngalangal).

Most Ponape fishing technicians are adapted to fishing on the reefs during low tide. In the periods of "whole" or "crooked" tides the water is too deep

for them to be employed. Women turn to hunting crabs in the mangroves and the men go to the mountains to trap wild chickens, catch wild birds, and hunt wild pigs or deer for protein. If the combined efforts of husband and wife are not sufficient for the family's needs, chickens and other domesticated animals will be used as the protein dish. During the periods of high and low tides, the family relies mainly on seafood for protein.

Pigs are consumed most often at feasts or when guests are being entertained. At least in Kiti and Matālanim District, and probably elsewhere as well, fresh milk was drunk and butter was made before the war. Ponapeans say they are very fond of butter but most of the milk cows on Ponape were killed for food by the Japanese during the war. Goats, geese, and ducks are also eaten. In olden times rats and dogs were eaten; informants say they have never seen anyone eat rats, and dogs are eaten very, very rarely. Snails, lizards, and carabao, all of which were eaten by the Japanese, are not eaten by Ponapeans.

Four methods of cooking are practiced by the Ponapeans: (1) baking (umun nän üm) in the hot stone oven (üm); (2) roasting (inim nän päs) over an open fire or on hot coals or "ashes" (päs); (3) boiling (inim äinpọt, pwoil) in water in an iron pot (äinpọt); and (4) frying (inim piräin) in oil or fat. The last two methods were introduced during the pre-Spanish period, when pottery and iron cooking utensils first became available. Baking on hot stones is the work of men even today; roasting, boiling, and frying are all the work of women. Ponapean cooking habits are remarkably clean, and no food that has fallen to the ground is ever eaten.

Baking on hot stones is done in a separate cook house (wạnüm) near the house. A bed of black basalt rocks is made on the surface of the ground, on which sticks of firewood are piled up in the shape of a Quonset hut. The ends, sides, and top of the pile of wood are covered with more rocks, which become red hot as the fire burns. When the fire dies down the rocks and ashes are scattered and the bottom layer of stones is swept clean. Food wrapped in leaves is placed on the floor of stones and covered with large leaves, old mats, or gunny sacks, and finally hot stones from the fire. The food is left in the "oven" to cook in its own juice and steam from the heat of the stones above it, beneath it, and at the sides. A similar method of cooking is employed throughout the Pacific, but it is usually done in a pit dug in the ground. Baking on hot stones requires two or three hours of a man's time and is seldom done more than once a day. Because the bulk of the food is prepared in this way, it materially effects the availability of labor.

Roasting on hot coals was formerly done in a pit (päs) left in the center of the stone platform on which the dwelling was built. The pit was about three feet wide, six feet long, and four feet deep, its bottom being level with the ground. Today women do their cooking in the men's cooking house (wạnüm). In roasting, the food is wrapped in leaves and laid on the hot coals, or it is turned on a wooden spit over the fire.

In general the larger and more important foods are baked by men in the hot stone oven, including most root crops, breadfruit, bananas, large fish, pigs, and formerly dogs. Smaller foods such as crabs, shellfish and other mollusks not eaten raw, small fish, wild birds, chickens, rats (formerly), and sometimes "Western yams" are generally roasted by women on hot coals. Mollusks are never baked on hot stones and fresh breadfruit, yams, and pigs never roasted on hot coals, except as left-overs from a previous meal which were being warmed up. Foods in both categories can be fried or boiled. Some foods are prepared in one way only; others in several ways; and some foods can be eaten raw (mas, wẹt) instead of cooked (lẹu). The manner in which a plant is cooked often depends upon the specific variety and its characteristics (see chapters 8 and 9.)

L̈l̈i, one of several special dishes, is generally made of breadfruit. Artificially ripened breadfruit is roasted on top of the hot stone oven (üm) while the fire is burning and the stones are still heating. The blackened skin is then peeled with wooden knives, the core is removed, and the flesh is beaten with a wooden pounder on a kava stone, which is carefully cleaned beforehand. First the kava stone is rinsed with water; then a fresh piece of coconut husk is placed face down on the stone and beaten with the breadfruit pounder (first in one place and then in another); and finally a small piece of hot stone from the oven is rolled about, sizzling and steaming, on the still damp surface to "take out the badness" and dry it still further. The pounded breadfruit is moulded into a loaf, over which freshly made coconut cream is squeezed. L̈l̈i is eaten only a few times each year, in the breadfruit season, after it has first been prepared for the district chief by the section chief. On this occasion the eating of l̈l̈i is followed by a meal cooked in the hot stone oven that has been prepared, and the making of l̈l̈i is a highly ceremonial affair. The men who pound the breadfruit and squeeze the cream must observe certain taboos, and all the implements used in making and serving the dish must be newly made. Other kinds of l̈l̈i are occasionally made using taro (l̈l̈l̈n sawa), Cyrtosperma (l̈l̈l̈n mwäng), or bananas (l̈l̈l̈n üt).

Tẹlẹmai is made from artificially ripened breadfruit that has been allowed to stand for three nights until it is very soft. The skin is peeled and the flesh is pounded in a wooden bowl (kasak). Then hot stones from the oven are dropped into the bowl and stirred with the breadfruit until it is cooked. Coconut cream is squeezed over it and then it is eaten. It is said to be softer and even sweeter than l̈l̈i. It is eaten only two or three times in the year, and some must be taken to the chiefs when it is made for the first time, but there is no set time for making tẹlẹmai as there is for l̈l̈i. Tẹlẹmai is eaten only between meals.

Ïthïth is generally made from yams, but occasionally Cyrtosperma, taro, a variety of bananas (utinkạl), arrowroot, "Western yams," or cassava are used instead. The yams, Cyrtosperma, or taro may be used by themselves, or mixed with bananas. They are grated on a piece of tin in which holes have been punched with a nail, coconut cream is squeezed over them, and they are baked in hot stones.

Kọruk is the name of preserved fish, eels, crabs, trepang, or shellfish. The bones and intestines, if any, are removed and the flesh is wrapped in banana or breadfruit leaves and roasted on hot coals until it is hard, dry, and solid. After this it will keep for a week on a rack in the smoke over the hearth, but it can be kept as long as a year by recooking it on hot coals every fifth day. This and pit breadfruit were the only forms of food preservation practiced on Ponape in early times, and when fish was plentiful it was prepared in this manner for periods of scarcity.

Kọurap is a baby food. It and the juice of drinking coconuts are the first foods given to children before they are weaned and it is fed to those whose mothers

have no milk. To make kọurap freshly grated ripe coconut is mixed with turmeric and a small unidentified fruit about an inch long and the flavored coconut cream is squeezed out. Other special dishes are pit breadfruit (mär) and palãi, which is fed to invalids.

Ponapeans prefer salty foods to sweet ones. Sweet foods such as sugar cane are eaten only occasionally, in small quantities, and between or after meals. Informants stated that Ponapeans bought little of the soft drinks imported by the Japanese and seldom ate the flavored ice sticks which the Japanese froze locally and sold for 1 or 2 sen each. Except for ĩthĩth, foods were never sweetened by adding fruit. After a meal is finished an individual may get up and cut a piece of sugar cane to chew or eat a fresh banana, some pineapple, or some other fruit. Fruits and raw vegetables may be eaten between meals at any time of day, but they are not considered a part of a meal, which is complete without any dessert.

In the early days there was one main meal, served about dusk, after which people went to bed. This meal was prepared by men, who started about four in the afternoon to prepare the hot stone oven. Aside from this meal the eating habits varied from family to family. Some people had only one other meal, which might be early in the morning, or about eleven, or about two when the husband and wife returned from the mountain farm. Others ate four or five times a day. Today nearly everyone has his first meal about seven or eight in the morning, and some people have adopted the European schedule for breakfast, lunch, and dinner. The evening meal is still the main one and is usually cooked on hot stones. The morning meal generally consists of rice, supplemented by food from the night before warmed up by women over hot coals. Left-overs may also be warmed up on hot stones by men, but this requires a much longer period of preparation. In addition to these meals Ponapeans drink tea or coffee upon first arising in the morning. Imported tea became very popular in the Japanese period, but in earlier times native teas were made using lemon leaves, hibiscus leaves, and the leaves and bark of a tree (mätheu) identified by Christian as sassafras or wild sarsaparilla. These are still used today either straight or to stretch imported tea.

Coconut juice is preferred to water for drinking purposes but, since cutting young coconuts to drink is wasteful and expensive when copra prices are good, water or the boiled juice of ripe coconuts may be used instead. The use of rainwater for drinking and washing began in the Spanish period when large jars became available. Before this, water for washing was usually taken from mountain streams, and drinking water came from springs (pwãrer) which are still in use today. Women dig a hole from one to six feet deep in moist ground with a digging stick and insert a spout into the wall where the water seeps out. The spout may be a kind of reed (rao, lirao), a native kind of ginger (iẹuiẹu) or, today, bamboo or a section from a banana trunk. Women carried water to the house three times a day when they went to the river to bathe, throwing out old drinking water and replacing it with fresh each time.

The Polynesian drink of kava (sọkọ) has been used on Ponape from legendary times. Kava is one of the few if not the only useful plant that is not regarded as having been brought to Ponape from other parts of the world. It is said to have been originally a piece of skin from the ankle of the deity Lũk, which was dropped from the sky into Section U5 where it grew for a long time before people knew how to use it. They learned its use by noticing how a certain rat with only half a tail sometimes acted as if it were drunk, wobbling and walking slowly, and then lying down anywhere to sleep. By watching the rat, they found it was eating kava, and when people tried it they got "drunk" also.

The effect of kava, however, is not like intoxication from alcohol. It does not lead to exhilaration, joyfulness, or boisterous and aggressive behavior, but rather to sleepiness and dullness. This lends an atmosphere to feasts on Ponape that is not in the least lively or festive. A Saturday night feast on Ponape is quite different from parties and celebrations in other societies, since most of the participants doze in their places and almost fall asleep. Actually there is some question whether kava is truly a stimulant. The Japanese report that its active ingredient, kava acid ($C_{15}H_{16}O_5$), has a soporific effect and causes local paralysis after producing a slight temporary excitement. They indicate that its popularity may be due in part to the relief of pain from gonorrhea it gives through the local paralysis caused when it is discharged through the urinary passage.

Ponape is the most westerly point in the distribution of kava in the Pacific. The drink has a very important place in the life of the island and is an essential part of every feast, at which kava drinking is more important than eating. Kava is served at feasts given at marriages, at funerals, in honor of visitors and of the construction of new houses, when a new seine has been completed, when large cooperative work groups come to clear a coconut plantation or repair a road, and for the chiefs. The use of kava is essentially of a public and social nature. When kava is in preparation the sound of the roots being pounded on the large kava stone carries throughout most of the section, and anyone who hears it may come and join the feast. Only the top chiefs were permitted to drink kava at home by themselves, though it is said that some others did so in secret.

The soporific effect of kava continues on the day after kava has been drunk. Since this interfered with the attendance and the efficiency of laborers, the Japanese restricted the use of kava. According to informants, an official permit or license from the District Office was required after 1930. Such permits were issued no more often than once a week. The Ponapean theory is that this sleepiness results only if one both drinks kava and eats, and they point to the manner in which old men used to drink kava nearly every night without falling asleep at the feasts, and still got up at two or three in the morning to plant their yams. It is said also, that the old men today who drink kava regularly but eat little are the first to wake up in the morning, and that the use of kava makes them feel light, energetic, and on their toes.

During the war the use of kava increased markedly. Apparently the Japanese did not bother to enforce their restrictions, and the Ponapeans drank kava so that they might not meet a disgraceful death; there were a few individuals who were killed in air raids with full stomachs, and the filth that came out of their intestines was regarded as very shameful. There was much talk about how disgraceful it would be if one also met the same kind of a death. Many of the people took to drinking kava every night instead of eating so that if they were killed they might at least die cleanly and without shame. In spite of this, they were able to get up early in the morning to perform forced labor for the Japanese.

The increased use of kava continued under the Americans, partly as a result of the speeches of the early proclamations that the military forces of America were liberating the world and that the Ponapeans were now free. The possibility of reinstating restrictions on the use of kava was considered by Military Government, but no action was taken.

Betel nut, which is widely used in Yap and Palau as well as to the south in Indonesia, is not chewed by the Ponapeans. Christian states that kathai and kotopw are varieties of the areca palm, from which betel nuts are taken. Ponape informants, however, say that the people from Yap who live on Ponape have tried the nuts of these two varieties of palm and found that they are not "intoxicating." The people of Yap have introduced a few areca palms (pū) from Yap onto Ponape for their own use, as well as the pepper plant the leaves of which are used with it.

Palm wine or "toddy" was introduced into Ponape from the Gilbert Islands in the Spanish period. It has never been as popular as kava because it is sweet. Not many people use or know how to make palm wine today. The Japanese made no attempt to restrict its use; in fact they themselves liked and used it. In addition to the alcoholic drinks which they imported, the Japanese distilled shochu (sōsu) locally. This contained 30-45 per cent of alcohol and is said to have been made from molasses, sweet potatoes, bananas, or rice. Many of the people of Ponape acquired a taste for hard liquors (soko en wāi or "foreign kava") from the gin and Scotch (sikot wīsīki) that they received from the whalers, and several Ponapeans expressed interest in the manufacture of shochu. Sales of intoxicating liquors to natives were restricted by the Japanese until about the time of Pearl Harbor after which shochu, saki, and beer could be bought openly.

Many Ponapeans do not smoke, drink, or use kava because of religious beliefs. These are those Protestants who are referred to as "Congregationalists" or members of the "Association of Not Smoke" (pwīn en sōta simok). Catholics and Protestants who are classed only as "Christians" or members of the "Sky clan" (soulang) may smoke and drink, but few Protestants in this class do more than smoke. Protestants who are members of the YMCA or Jugendbund (pwīn en mwānankap, iukenpunt) may smoke, though few of them do, but cannot drink.

Smoking, like drinking, was learned from the whalers in the pre-Spanish period. Cigarettes are by far the most common form in which tobacco is consumed. A few of the older men continue to smoke locally grown tobacco in pipes even though this requires a great deal of work to produce because of the cutworm, but most prefer the milder imported tobacco. Because of wartime shortages, people were forced to return to the cultivation of tobacco, about 1943, and imports of cigarettes were not yet sufficient in 1946 to permit it to be abandoned again. Shredded tobacco is rolled by hand into crude cigarettes (siga) using dry banana leaves or any paper that is available. Two forms of pipe are used. One (pāip) is made in the conventional shape with a small bamboo bowl and a bamboo or Miscanthus (alek) stem. The other (pāip pāini) is made of rolled coconut leaf in the form of a cigar holder which is stuffed with tobacco. In the Japanese period, for the first time, a few people started smoking cigars. Snuff is not used, but a few of the old people chewed tobacco, having used chewing tobacco in the Spanish period and earlier, "niggerhead" in the German period, and tobacco from cigarettes in the Japanese period.

CLOTHING

Ponapean traditions tell how, after the island was built and first settled in the beginning of legendary times, the original inhabitants and their descendants descended almost to the level of animals, without any of the material aspects of culture. The clothes which they had brought with them wore out, and they went about naked until clothing (likāu) and the plants from which clothes could be made were introduced to Ponape. Some informants have heard of a time when the women of Ponape wore grass skirts and the men either went naked or wore G strings (waiwailol) such as are worn today by the men of Kapingamarangi, Pingelap, and Mokil. This period, if it did exist, was in the extremely remote past and at the time of contact Ponapean dress was quite different.

The traditional form of men's clothing was the grass skirt (kōl), which was worn without a G string or anything else underneath. On special occasions such as war dances, chiefs and old men wore about the waist a finely woven banana fiber belt (thōr), decorated with pendants of the pinkish shell of a rock oyster, Tellina sp. (pwākē). These two garments constituted the full dress for men, and most of the time only the grass skirt was worn. Skirts made of coconut leaves were preferred, but others were made of hibiscus bast, banana fibers, and of the fibers of the roots of pandanus (mwathal and kipār). As noted, for chiefs the coconut leaf fibers of the skirt were specially crimped with the kōpil shell.

Even informants more than fifty-five years old had never seen the old-style belt worn. Some had seen specimens that had been saved in boxes, and several are in the Bishop Museum in Honolulu. Christian spoke of the loom as "long out of use" when he visited Ponape in 1896, and today there are no women left who know how to make the old belts. At the end of the Spanish period, the younger men already wore trousers and shirts, introduced by the missionaries in the pre-Spanish period, and the old men wore skirts and shirts. By the Japanese period, grass skirts had completely disappeared, except for the occasions when the Ponapeans were called upon to perform their songs and dances for the Japanese. They were never worn at any other time, even for their own feasts and ceremonies. With trousers, a European-style belt (kateng, pirapir) made of pandanus (kipār) leaves or coconut leaf was worn.

Cloth and trousers were manufactured on Ponape by the Japanese. Both were liked by the Ponapeans because they were strong and heavy, but production was not in sufficient quantity for local needs when imports were cut off by the war. When clothes could no longer be purchased, Ponapean men at first wore women's wrap-arounds. There was a great deal of derisive laughter and gossip when the first man appeared in women's clothing, but it was not long until others were forced to follow suit and it ceased to be a laughing matter. Later it was necessary for most men to use grass skirts. In the first year of American occupation, supplies of clothing were insufficient to permit a complete return to trousers, and men wearing grass skirts were still commonly seen.

The basic item of women's clothing in the Native period is described as a wrap-around of bark cloth (maimai, likāu maimai) made from the bark of the breadfruit tree. This has been completely replaced by imported cloth, and informants had not seen it even in their childhoods. Christian speaks of the woman's wrap-

around as being woven from the bark of nïn (Ficus tinctoria), but informants said that nïn was used only as thread in sewing the breadfruit bark cloth. In addition a type of short poncho or shawl (lithinimwar, pāiyan) made of strips of hibiscus bast was worn by women over the shoulders, but this also disappeared early. According to one account it served as a kind of nightgown, as a kind of raincoat, and to cover their breasts when women appeared in public.

Dresses and chemises were introduced with shirts and trousers by the missionaries in the pre-Spanish period, and it seems likely that piece goods for wrap-arounds, obtained through trade with the whalers, were one of the first items of European clothing adopted. At the end of the Spanish period women wore dresses and chemises on Sunday, and only a wrap-around during the rest of the week unless they went out in public. It was not until the Japanese period, when for the first time nonnatives were scattered all over the island, that women began wearing dresses around the house on week days. A few women wore blouses and wrap-arounds in public instead of dresses and chemises from the Spanish until the Japanese period, when this form of dress disappeared.

The style of dress first used on Ponape was introduced by Mr. Doane, an American missionary. It had a small prim collar, long sleeves and cuffs, a loose blouse and a full skirt that hung in folds to the feet, and it is said to have taken six or seven yards of cloth. This dress, however, was quite different from the "Mother Hubbards" of the Marshalls, which have never been worn on Ponape, being fitted at the waist, with a different collar, and sleeves and blouse that were not so full. This style lasted until the German period when a dress with short sleeves, a low neck, and a long skirt, hanging straight from the shoulders without being brought in at the waist, was adopted. In the early 'thirties this dress was somewhat adapted to Japanese fashions, the skirt being shortened to a length of six inches below the knees, giving the style of dress worn at present. Informants had heard of no Japanese regulations prescribing short sleeves and short skirts for women or shorts as the regulation working costume for men.[2] The American dresses seen in the movies have been admired by the Ponapeans, but it is expected that the prewar styles will continue for some time.

The methods of making shawls and bark cloth wrap-arounds have been completely forgotten, and could not be revived even during the period of wartime shortages. As dresses were worn out women were reduced to wrap-arounds. This meant that even older women were forced to appear in public with their breasts exposed, as some of the younger women are said to have done even before the war under the Japanese influence. Eventually even the missionaries gave up preaching against the evils of this practice, and when wrap-arounds made from mattress covers and sails taken from the canoes began to wear out some women were left without any clothing.

The possibility of wearing grass skirts was not considered seriously by women until about a week before the Japanese surrender, the imminence of which was kept a secret from the Ponapeans. At this time a rumor went around the island that no one had any more clothes and some women started making grass skirts for their own use. With the arrival of the Americans a small amount of cloth became available, but did not materially relieve the situation. Some women received piece goods in February but as late as mid-summer 1946, nine months after the American occupation, from fifty to one hundred women in Matālanim District alone were hiding out in the farms because they had no clothing. Rather than face the humiliation and ridicule of appearing in grass skirts in public they stayed in the farm, running away from the house and hiding in the bush when anyone approached. They could not go to the hospital or the store in the Colony or to church unless they borrowed the dress or wrap-around of a friend who was willing to stay home. During this period only one woman, so far as is known, appeared in public in a grass skirt. In lieu of other materials, some women made clothes out of mosquito nets which were sold in the summer of 1946. The broad hems were used for wrap-arounds and the netting was made into dresses, which were perhaps better than nothing although they did not satisfy the local standards of modesty.

In the early days, the only form of hat was the visorlike sunshade (pwǫ̈isǫ̈u) made of coconut leaf and worn by fishermen. This can be made in a few minutes and is thrown away when the fishing is over. Since the Spanish period, hats (lïsarop) of European design have been worn. In the Spanish period they were worn by only a few; more wore them in the German period, and today almost every man has at least one. Most hats are made locally of coconut-leaf fiber or of pandanus, and cost from 2 yen to 5 or 6 yen before the war. Some men wore hats imported from Mokil and Pingelap. The very best hats, which were of an extremely fine weave and sold for as much as 20 yen before the war, were made of coconut leaf and were imported from Mokil. Ponapean women have never worn hats, except when they borrow a man's hat as protection from the sun when out in a canoe. The Japanese women did not wear hats, but Ponapeans have seen them worn by Belgian women on Ponape. They have not laughed at the hats worn by American women in the movies (as they laugh at kissing); in fact the reaction seems to be one of approval. The women like such hats and would like to own them.

OTHER CONSUMERS' GOODS

The old native sleeping mat (lǫ̈s) was sewed rather than woven. Strips of pandanus were sewed crosswise so that the mat rolled up easily, and an end which was not unrolled served as a pillow. The old mats took as long as a year to complete and were expected to last at least seven years. Some lasted twenty or thirty years and there was a man eighty years old who still used a mat that belonged to his father. Such mats are rare today, and not many women know how to make them. They began to disappear with the introduction of cotton and kapok, when pillows were made locally. Today a thin type of woven mat (lirop), introduced from Mokil and other neighboring atolls, is usually used with pillows. If they are made in a coarse weave from one kind of pandanus (mwathal), one or two can be completed in a day and can be expected to last about seven months. Made of another pandanus (kipär) in a fine weave, they may take two weeks to complete and last two years. Some of the finest of the new mats were imported from Mokil and other atolls and were bought by Ponapeans at 4 yen each before the war. Imported

[2]Cf. East Caroline Islands, Civil Affairs Handbook, OPNAV 50E-5, Washington: Navy Department, 1944, p. 37.

Japanese straw mattress rolls were also commonly used. Some people also had mattresses stuffed with cotton and kapok. Imported mosquito nets had replaced the native net (tĕn amusę), which was made from strips of hibiscus bast (sŏpą).

In bathing men use imported towels, whereas women use local sponges (lïmw). Each woman has three sponges, one used only for her face (lïmw ęn mwas), one used only for her feet (lïmw ęn withę̆), and one used on her body (lïmw ę̆n thuthu). The same type of sponge is used for all three purposes. Since the body sponge is also used during menstruation, it is a very personal item. When it is carried to the bathing place it is carefully concealed in a small towel or handkerchief, and because it is obvious what the package conceals, it may be hidden behind the back or put under the armpit in passing men, particularly men of one's own clan. In former times a very attractive sponge basket (kopŏun limw) made of a rattanlike forest creeper (ithänwal) was used, or the sponge was wrapped in a Macaranga (äpwith) or hibiscus (kalau) leaf.

Women are not segregated in menstrual houses on Ponape, but while menstruating they must avoid touching food with their hands; they may cook using wooden tongs, but must make false excuses if they are called upon to squeeze coconut milk or cut yams. The use of the sponge by women dates back to the Native period. Before men had cloth towels they dried their bodies by scraping the skin with the edge of a coconut leaf. Before they had soap, men and women sometimes squeezed coconut milk on their arms before bathing. Formerly women bathed themselves three times a day when they went to the stream to get water, once on first arising, once about midday, and once in the evening. Men bathed themselves only in the evening. Today the pattern is much the same except that the woman's midday bath is omitted.

Clothes are washed in the river with laundry soap. Soap has been available ever since cloth has, though during 1945 and 1946 many people had to do without it. Washing clothes is woman's work and today is usually done twice a week, on Thursday and Saturday. Since most people have only one suit or dress, they stay at home in their underclothes while the laundry is being done. Clothes are usually pounded on a stone with a piece of hibiscus or a mill-sawn plank and then spread out on the grass to dry. They are ironed with a charcoal-burning iron in which charcoal made from coconut shells is used. Most families owned their own irons before the war; those who didn't might try to rub their clothes smooth with a bottle, or sent them to a laundry. Before the war there were about six natives, two Filipinos, and four Japanese in the Colony who took in washing, charging 10 sen per piece regardless of its size.

The Ponapeans take particular care of their teeth, which they like to keep white and clean. In the olden days men cleaned their teeth by rubbing them with their fingers, and women used their face sponge. In the Japanese period they started using toothbrushes, and people still had the ones they bought before the war, although these were very worn. It is said that when American planes came overhead Ponapeans grabbed two things before they ran to hide, their clothes and their toothbrushes.

Perfumes have been used for a long time and are highly prized. In the native period a perfumed oil (lę̆nusęl) made from coconut oil and flowers or sweet smelling barks was rubbed on the hair and body after bathing and at feasts, and was also used to annoint guests. Today these scents are regarded as old-fashioned by the young people who like the stronger imported perfumes in the form of alcoholic perfumes (lę̆n wai), perfumed oils (lę̆n wai), and pomade (pŏmäte). In the German period the alcoholic type was preferred, but since the Japanese period pomades have been the most popular. Only a few of the young girls who had been domestic servants to the Japanese used face powder, but all the younger women over eighteen years old liked lipstick. It was said that they feel they must have lipstick on even when they are dressed only in their wrap-arounds.

In the olden times men plucked their facial hair with fish scales, but only a few old men do this today. Most men used straight-edged razors once a week, on Saturdays. There were only one or two safety razors on Ponape under the Japanese, but Ponapeans may accept them. Men had their hair cut each Saturday by barbers who charged 10 sen and came to the house in the outlying districts. In the Colony there was one native barbershop and many operated by Japanese. The price of 50 sen included a shave. Women cut each other's hair. Young women tie their hair with hair ribbons and the older women do theirs up tightly in a knot on top of the head with simple curved combs, in the earlier fashion.

In baking on hot stones Ponapeans use discarded carrying poles (thï) of hibiscus as spreaders to scatter the rocks and ashes when the fire has burned down, and they use hibiscus tongs (tïpw, tïpw ęn um) in replacing hot rocks on the oven. The tongs are two or three feet long to begin with, but they become shorter as they are charred in use and are discarded when they are about a foot long. They can be made in two or three minutes by splitting a section of a carrying pole down the center and they last about three months. Black basalt is the best available stone for baking. Although it splits into smaller pieces in the heat, it does not disintegrate completely as coral does and it can be used over and over. In the old days basalt was traded to Ant and Pakin, and perhaps to Mokil and Ngatik as well, for cooking purposes. Wooden tongs (tïpw, tïpw ęn pąs) made by splitting the aerial roots of pandanus (mwathal) are used to handle the leaf-wrapped packages of food. These tongs require about ten minutes to make including the time required to procure the wood, and they last about a year. They are two feet long when they are new and are discarded when they have burned down to about a foot.

Fire was formerly made by the fire plow. A small piece of hibiscus called the "child of rubbing" (näinïth) shaped to a size about 3/8" by 1" by 12" and with a triangular point at one end is rubbed against another piece of hibiscus called the "mother of rubbing" (ïnanïth), which is usually a discarded carrying pole. Another wood (topwu) is sometimes used instead of hibiscus. When the "child" is rubbed against the "mother," a fine dust collects in the groove that is formed. It is ignited by the heat produced by friction and is blown to a glow once it has begun to smoulder.

In the days before matches, a fire was kept going night and day in the pit where the women cooked. For this purpose the Ponapeans used a special wood (lap-winmwai), pieces of a kind of mangrove (akapā) that had fallen and begun to decay but had not yet disintegrated. Two or three of these sticks were laid on the hearth with their ends together, and one of the women in the household got up once or twice during the night

to move the ends together so that the fire did not go out. A piece of this wood would burn as long as a week. Today there is no special wood for firewood, but those most commonly used are äis, marasao, mwęak, äk (Rhizophora), and pŭlok (Xylocarpus). Coconut shells are generally used by women for roasting, boiling and frying, and the fibers of dried coconut husks are used by both men and women as tinder.

Matches replaced the fire plow after European contact, but the techniques were not forgotten. A race in which the contestants must light a cigarette with a fire plow before they cross the finish line is a standard sports event on Ponape. During the war, when matches were difficult or impossible to obtain, fire plows were revived by the Ponapeans and were also used by the Japanese. They were still in use during the first year of American occupation.

Imported knives have replaced native knives in cooking except in the preparation of breadfruit. Contact with metal is said to spoil the flavor of breadfruit, and people who are particular about their food use nothing but wooden and shell tools in preparing it. Breadfruit is split or quartered with a chisellike implement (pwäi) made of kątięu (Ixora carolinensis), which may have replaced the shell tool of the same name, and which was also once used for cutting taro, yams, and other roots. In the preparation of pit breadfruit the breadfruit is quartered with this implement and peeled with an instrument (pwĭlĭamai) fashioned of the tiger cowrie (pwĭli). To make this latter tool the top part of the cowrie shell is ground off at both ends so that the skin can pass through the shell, like the core of an apple through an apple corer. In making and in sharpening this instrument the Ponapeans use a grinding stone (ŭnanth pwĭli) made of a special white stone found only in section K13.

Lĭli is prepared with wooden knives (răr) of hibiscus and wooden pounders (päirar) of Morinda citrifolia (wĕipwul). It is served on banana leaves, heated over the fire so they will not shred and laid in a coconut leaf basket (pwät ęn lĭli) of a special form, and it is eaten with spoons (tęu) made of coconut husks. All these implements or utensils are associated specifically with making lĭli and except for breadfruit pounders, which were formerly made of coral, are thrown away after having been used only once.

Water was carried in coconut shells (isąk) and gourds (pwĭlęl) tied in pairs and hung over a notched carrying stick (ĭni ęn pil) used only by women. Drinking water was hung from the rafters in these containers. Water for washing the hands was kept in a wooden bowl (kasak ęn thępwęthępw) in the house. Water to pour over the feet before entering the house was kept in another wooden bowl (kasak ęn withę) set just outside the door. Today enamel washbasins and metal drums have replaced the wooden bowls, and Japanese beer bottles have replaced the coconut shells and gourds.

Pottery-making is not practiced on Ponape. Soon after contact, the use of shells such as Atrina (pwąiąką) as plates disappeared, and imported cooking pots and dishes were adopted. The use of leaves for cooking by the old methods continues, but imported cooking pots are essential for frying and boiling. On some occasions food is eaten from leaves and baskets today, but before the war every family had china, glassware, and cutlery that were prized possessions and important measures of wealth and economic status. During the war many Ponapeans buried their table ware in the ground to prevent its being taken by the Japanese. After the Japanese evacuation these were dug up and assorted oddments of china and glassware were picked up about abandoned Japanese camps and houses. Ponapeans are accustomed, however, to laying a table for guests with matched sets of china.

Most furniture was made locally by Japanese cabinet makers but some was imported from Japan and a few pieces made in Germany were still in use. Japanese furniture was excellent in quality and low in price. Some Ponapeans owned phonographs. Hawaiian, Japanese, and American records were popular (the latter including tunes dating back to "Constantinople"), which were still being played. Several natives had guitars, ukeleles, and other musical instruments. There were two native bands that played for Ponapean and Japanese dances.

PRODUCERS' GOODS

Shell axes (kĭ) and shell adzes (mathau) were formerly used in canoe building. Both were also known as sĭla (Tridachna elongata), the shell which was best for making the blade; Tridachna gigas (pāsu) shells were also used. Today these tools have been completely replaced by steel axes and adzes, for which the old names sĭla and mathau are still used. The shell blades were sharpened with mushroom coral (läpąwąth), which was also used as a file to smooth the sides of the canoe. The shell axe had a straight handle of mąrąpwęnsęth (Heritiera littoralis), äk (Rhizophora), or luwās. The adze had a two-piece handle with a butt of äpwith (Macaranga) and a fork of ngĭ (Pemphis acidula) or luwās. Saws of the Japanese type, hammers, nails, augers, planes, chisels, squares, and other carpenter tools have been adopted.

Imported knives or machetes (näip) have completely replaced shell knives in farming. Pwäi or pwaięmai (Pinctada galtsoffi) and lipwoi (Anadara anticuata scapha) were said by different informants to have been used in clearing the fields before knives were available. The former was also used in cutting breadfruit and root crops and in warfare. The latter, in addition to being used as a knife, served also as the coconut grater and is still used as a sinker on fishing seines; all of these were known as pęlik, rather than by the name of the shell itself (lipwoi). Steel coconut graters, which unlike their shell predecessors are fastened to a block of wood on which the user sits, are now used exclusively. A Palau man was set up as a blacksmith to produce copra knives from Japanese scrap metal using tools salvaged from abandoned Japanese smithies. There were no native blacksmiths before the war, though there is an obvious need for their services both in the production and the repair of metal items.

The digging stick (äk) is still widely used in farming, and on any other occasion when holes must be made in the ground. The word äk is applied to men's digging sticks (äkęnpwar), to women's digging stick (äkęnli, akęli), to coconut huskers (äkęn kotharin), and to several varieties of mangrove (akęlęl, akapā, and sŏm). The men's digging stick is from seven to nine feet long and about two inches in diameter. It is usually made of akęlel (Rhizophora) and less frequently of wäingal (Lumnitzera), or kątięu (Ixora carolinensis). Ngĭ (Pemphis acidula) is another hard wood, but is said to be too short. Ixora is used mainly by people who live in the hills back some distance from the shore where mangrove and Lumnitzera grow. The woman's

digging stick is only about four or five feet long and somewhat thinner. It is usually made of kạtieu, or sometimes of akẹlẹl.

Both are sharpened to a pencillike point at one end, which must be resharpened whenever it is dulled by striking against stones in use. As digging sticks are resharpened they become shorter, and as they are used they lose moisture and weight and become lighter and harder to use. New digging sticks must be made twice a year. A man makes a new digging stick at the beginning of the season when yams are planted and again when breadfruit pits are made; at the end of each of these seasons the digging sticks are thrown away. Men and women make their own digging sticks in about a half-hour's time.

In the Spanish period a metal digging stick (ăkmẹta), also known as a "crowbar" (krobar) was introduced. This implement is very well liked because of its weight and because it does not have to be resharpened. They were imported in manufactured form through the Japanese period and for the most part have replaced the men's digging sticks. A few women now use iron rods that they have found in place of wooden digging sticks. Metal digging sticks never were imported for women, reinforcing rods and other light iron bars that had been abandoned by the Japanese being adapted locally for this purpose.

The coconut husker is five feet long and is best when made of ngĩ, although akẹlẹl, wăingal, and kạtieu are also sometimes used. Its point has a different shape from that of the digging sticks, almost triangular in cross section. It can be made in about two hours and lasts about a year. It is driven into the ground so that it slants slightly away from the user, and the coconut husk is brought down upon it with a great deal of force and then twisted so that a section is loosened. Iron heads which were put on a shaft of kạtieu or hibiscus were sold by the Japanese, but most people continued to use the old form.

Two types of copra-drying sheds are used, the commonest being that known as a "heating house" (ĩmw ẹn kạrang). This is about 18 feet long and 12 feet wide and is usually thatched, though some have iron roofs. The thatched roofs are said to be adequate to keep out the rain. The walls are of wood or of coconut leaves. Inside there are wooden pieces about three feet apart running the length of the shed on which trays (pasapas ẹn mwangas) filled with copra are set. The trays themselves are six feet long and three feet wide and are made by tying Miscanthus (alẹk) to two pieces of long wood with two or three wooden crosspieces added for strength. The wooden racks are so constructed as to hold four layers of trays, with about twelve trays to the layer, the bottom layer being about four feet from the ground. The fire is generally built directly on the floor. Some sheds had a built-in gasoline drum with a chimney leading up through the roof so that the fire could be built in the drum without filling the shed with smoke, but these were uncommon because stove pipe was difficult to get.

The other type of shed is known as a "drying house" (ĩmw ẹn pạlạng) and is used only where there is sufficient wind to dry copra without fire. In construction it resembles the "heating house" except that it has wider eaves and no walls. It is erected on a small artificial island built up on a reef out in the lagoon by piling up large chunks of coral until there is a stone floor a foot or two above the high-tide mark. The racks are built up near the overhanging roof so that the rain cannot reach the copra, and are four feet or more above the floor. Both types of sheds are themselves referred to as "drying houses" (ĩmw ẹn pạlạng).

A special breadfruit picker (pĩlẹt, pĩlẹt ẹn măi) is used to prevent breadfruit from bruising and spoiling. This is a long slender pole to which a short piece of wood is lashed with sennit (pwẹl), forming a very narrow fork. Hibiscus is used for the pole, which is about 18-24 feet long and 2-3 inches in diameter at the base; bamboo is sometimes substituted for hibiscus today. The pole is cut and peeled, straightened over a fire, and hung up for a week to dry, with the top end fastened to the branch of a tree and stones hung as weights from the bottom. This makes it both straighter and lighter, and easier to handle. The second piece of wood is about two feet long and three quarters of an inch thick. Usually a piece of kạtieu (Ixora carolinensis) is used that has been bevelled along one side from the center out towards both ends, or which is naturally bent. When this is lashed by its lower end to the pole, there is a gap of about three quarters of an inch between its top end and the pole, which projects out another six inches. The breadfruit picker is used by wedging the stem of a breadfruit into this gap, and then twisting and pulling until the stem is broken. The breadfruit does not fall as long as the handle is held twisted at an angle. No substitute for this instrument has been introduced and the head of every household has one during the breadfruit season. New breadfruit pickers are made by men in about half an hour at the beginning of each breadfruit season and when the breadfruit are gone they are thrown away even if they are still good.

A similar instrument is used by women as a flower picker (ŭwẹs) when they are making perfume or garlands, and is sometimes used in picking mangoes and mountain apples. It is made from Miscanthus (alẹk) and is about twelve feet long. The top eight inches are bent back on the main stem and bound with sennit along the top four inches. The flower picker is used like a hook, with the stems of flowers and fruits being caught in the three-quarter-inch gap that is left. It is made by women in about five minutes time and every woman owns one. It is usually left hanging in the branches of a tree while it is in blossom and if someone takes it, another is made.

Several types of hand net (năik) with wooden handles are used in fishing. The smallest of these (năikẹtik) is from 3 to 6 feet in length and has a net of hibiscus twine (ñgkọl) made from soaked hibiscus bast (sŏpạ) or one of imported twine. It has a two-piece handle made of a forked piece of marasao and a straight piece of Hibiscus (kalau) or Macaranga (ăpwith). Hibiscus twine or sennit (pwĕl) is used in tying the handle together, in tying the net to the handle, and in tying floats to the net. The floats (kapĕ) are about an inch in diameter and an inch in length and are made of the pulpy interior of the stem of the ivory nut frond. The handle of the net is bent into a bow by the tension of the net, and the floats are tied on the upper edge of the net nearest the handle. The small hand nets, which are always used in pairs, are made and used by women. They take about a week to make and they last about six months if made from hibiscus bast or about 18 months if made of imported Japanese fish twine.

The large hand net (năikalap) is similar in design. Both the forked and the straight piece of wood in the handle are of hibiscus (kalau) and the net is made of hibiscus twine (ñgkọl), or less frequently of banana fiber (kisinimạt) or imported twine. The floats are also

of the pulpy interior of the ivory nut frond, but are an inch and three quarters in diameter and five inches long. The handle is tied with sennit, and sennit, hibiscus twine, or imported twine may be used in fastening the net to the handles and the floats. The large hand net is between 9 and 15 feet long, and requires about three days to make the twine, about a week to do the netting, and another day to make the handles and complete the net. It is said to last about six months if made from banana fiber, a year if made from hibiscus, and a year and a half if made from imported twine, though one informant indicated that banana fiber lasted longer than hibiscus. A still larger hand net (nãik en thakathok) that was between 15 and 18 feet long has not been used since the German period.

Another type of nãik known as lukŏuk has a curved handle made of a single piece of ñga or ũnge. It is about four feet long and has a very fine mesh about a quarter of an inch square. The net is always made of sennit (pwẽl) and it takes a long time to make, but it may last from seven to twenty years. Very few nets of this type were left on Ponape.

Three sizes of seines (ũk) are used. The small seine (ũkẹtik) is 2 or 3 yards wide and from 30 to 40 yards long with a mesh about an inch and a half square. The medium seine (sąkisąk) is 4 or 5 yards wide and 40 to 50 yards long and has the same sized mesh. The large seine or gill net (ũkalap) is 8 yards wide and about 70 to 100 yards in length with a three inch mesh. The seines are most commonly made of a heavy hibiscus twine (ñgkọl) that is about an eighth of an inch thick, or from imported twine. Making the large-sized seine requires the steady work of two families for about three months; usually the work is divided between two related families, each one making half with the help of clan members. Not counting the time used in preparing the soaked hibiscus bast (sõpą) it takes a man four solid days of twisting and one solid day of netting to make four yards of net. By working steadily a man can twist about 100 yards of cord a day, the equivalent of one yard of net.

The floats (ũs) used on the large seine are cylindrical sections of kalau (Hibiscus) about three inches in diameter and fifteen inches in length, squared at the top and pierced with a hot iron rod. They can be made in about three days using the poles from which the bark has been stripped to make the twine. The floats (ũs) for the small and medium sized seines are flat pieces of hibiscus in the shape of a truncated triangle, about three inches wide at the bottom, half an inch thick, twelve inches long, and pierced with a hot iron at the top.

Sinkers (pẹlik) for all sizes of seines are made from the lipwoi shell (Anadara antiquata scapha), through which holes have been knocked. All the halves from one side of these bivalve shells are used on one side of the net and the other halves are used on the other. The net is always dropped so that the concave side of the shells face the reef and the fish. The base of a lithik shell (Conus) is used as a marker (ũlang) to indicate the center of the net. At each of the four corners of the seine, handles containing charms to insure good fishing are placed. In addition to certain magical ingredients, they contain turmeric wrapped first in the fabriclike coconut cloth (inipal) and then in coconut leaves.

Since the German period, imported twine has been available, and in the Japanese period both twine and ready-made seines could be bought. The Japanese fishing twine cost more than that sold by the Germans and did not last as long. Used steadily six days a week, a large seine made of imported German twine lasted three years, one of Japanese twine two years, and one of hibiscus twine one year. Most seines lasted longer, however, because they were not used regularly.

Lead sinkers were also sold and the ready-made nets came equipped with lead sinkers but not with floats. Some people used lead sinkers with seines they had made from imported twine, but others removed the lead sinkers and replaced them with lipwoi shells, which are believed to prevent the fish from escaping beneath the net. Only shell sinkers were used with large seines made of hibiscus twine, and with all large seines, whether ready-made or of hibiscus, Conus shell dividers and the handles at the four corners were always used.

A circular throwing net (ũk ląkitąk) has been used by a few men since its introduction in the Spanish period. It has a two-inch mesh, a three-yard radius and is always made of imported twine or is imported ready-made. A few dip nets (kipẹn) about 18 inches in diameter, with a half-inch mesh and a two-foot handle are made and used by women. The dip net is now usually of imported twine, though hibiscus twine (ñgkọl) is also used; the frame and the handle are both of kątiẹu (Ixora carolinensis). Once the hibiscus bast has been soaked and dried, it can be twisted, netted, and completed in a day. Torches (inthil) for night fishing are made of dried coconut leaves (pãthil). Derris root is used as fish poison.

Throwing spears (kątiẹu ẹn thok), before contact, were made of a sharpened piece of kątiẹu (Ixora carolinensis) or a shaft of this material with the barb of a stingray (likąnthinikąp) attached. Since the German period, imported heads for throwing spears have been sold and they have been used with shafts of kątiẹu, hibiscus (calau), or bamboo (pãri). Bamboo is less satisfactory because it is hollow and hafting is difficult. Before the German period, when all throwing spears were made of kątiẹu, which does not float and could be used only on the reefs, throwing spears were rarely used. After the war, heads for throwing spears with from one to four sharpened pieces of heavy wire were made locally by Ponapeans from scrap metal.

Two kinds of diving spears (kątiẹu ẹn thu) are used. One is about 3 feet long and has a shaft of kãnmant or less frequently of bamboo. The other is about 15 feet long with a shaft of akẹlẹl (Rhizophora), kathai palm, nĩ (coconut) or iron pipe. The same type of metal head is used on both. This head is from about 10 to 18 inches long, with a single point, either plain or with a single or double barb. These points were also imported in the Japanese period and since the war have been made locally out of scrap iron by Ponapeans, using only an ordinary fire, without bellows, and a hammer and file. To prepare and straighten the shafts over the fire takes three days for the long spear and about one day for the short one. The head can be made in about an hour with a suitable iron rod, and the spears when finished last a year or two. Both kinds of diving spears are new, having been introduced by the Okinawans in the Japanese period.

Fishing with hook and line is also new to Ponape since the period of contact. The Ponapeans do not practice trolling and they had no shell, bone, or stone fishhooks in the Native period. All fishhooks are imported, and although they have been available since the pre-Spanish period, they are not widely used except by the out-islanders. Fish line and wire leaders were also imported.

Fish weirs (mäę) and fish traps (ü) have become obsolete. The former were made of coral and used at the mouths of streams, rivers, or inlets. In shape they resembled a series of U's with the prongs facing out toward the lagoon. The fish traps are said to have been almost identical to the type used on Ponape today by the people of Yap. They were three feet long, one foot tall, and a foot and a half wide. Fish traps were made and used by men, using kątięu (Ixora carolinensis) tied with sennit (pwę̆l).

In former times there were three kinds of canoes (wär); the large and beautifully decorated "carved canoes" (wărasap) of the district chiefs that held from 15 to 20 people, which are now obsolete; the section canoes (wär ęn köusap), which disappeared during the war but which may be replaced; and the private canoes (pänta), which were of the same design as the section canoes and could be either larger or smaller.[3] Ponapean canoes are characterized by outrigger attachments that are bent at right angles and by a shallow draft and rounded bottom, which makes them well adapted to crossing the reefs within the lagoon although for sailing they are inferior to Mokil and Marshall type canoes, the deep sharp bottom of which acts as a keel. There was no evidence that Ponapeans were adopting the canoe types used by the out-islanders on Ponape or that the design of the Ponape canoe had been influenced through contact. The modification in design that was apparent was the simplification of the outrigger attachments on a number of canoes, although canoes with the classical type of outrigger were still being made. The number of people who know how to make the "sticks" and to tie the knots or lashings properly was said to be decreasing.

For the body (wărongǫ) the two best woods are satak and kęmą̆, though the latter is rare. Mäi (breadfruit) and thŏng are next best, after which come karara, mărikinlang, păr (Erythrina), or pingiping. The outrigger float (thĕm) is always made of one of the three varieties of hibiscus (kaläu), as are the two heavy crossbeams (känti) that form the main support of the outrigger. For all other canoe parts, except the paddles, the variety of hibiscus that is used is that known as likithal. The two main crossbeams run from the body of the canoe to a lengthwise piece (pwękitham) of hibiscus set above and parallel to the float, to which it is attached by four pairs of crossed uprights (räk) made of kątięu (Ixora carolinensis).

Between the main crossbeams and overlying the water is a platform (părapw) made of stalks of sword grass, alęk (Miscanthus), tied together. In some canoes the stalks lie crosswise to the canoe and are supported by three lengthwise pieces (kănsęr) of kątięu (Ixora carolinensis), which rest on the main beams. In others the stalks lie lengthwise and are supported by two crosswise pieces (tükan părapw) of hibiscus fastened to the sides of the platform from below. The sides of the platform are formed by two lengthwise pieces of hibiscus tied to the top of the main beam; one of these (kănęl'ięs) lies close to the edge of the canoe body and the other (kănsarąk) is about half way to the outrigger.

A pair of smaller crossbeams (pętętok) of hibiscus rest on the platform sides and run out from the canoe along and above the main crossbeam. Between the parallel pairs of crossbeams a pair of short crosswise pieces (sŏpinmasamp) of hibiscus may be placed to serve as ends of the grass platforms, but they are sometimes omitted. The outer ends of the small crossbeams, which extend only a short distance beyond the edge of the grass platform, are joined by a lengthwise piece (ŏupatotok) of hibiscus.

Two long diagonal pieces (thokowar) of hibiscus run from the ends of the canoe to the outer ends of the main beams above the float. Two lengthwise pieces (ŏupat) of hibiscus, set in line, run out to these diagonals from the grass platform, where they are fastened to the tops of the pętętok. A single piece (sŏnan'ik) of hibiscus, about halfway between the outrigger and the edge of the grass platform, joins the two diagonals. Directly beneath this are two other lengthwise pieces of hibiscus, one (ütingąnrąk) fastened to the top side and the other (salawar) to the bottom side of the main beams. Another lengthwise piece (salatham) of hibiscus is sometimes fastened to the bottom side of the main beams directly below the outer edge of the grass platform.

The bent pieces that are distinctive of the Ponape canoe are made of äis and are carefully lashed at the point where they turn at right angles. Two of these (äpis ęn limänrąk) run from the body of the canoe out to the float just outside the pair of crossbeams and are strengthened by being tied also to the salatham and salawar. Six others (äpis), joined together in sets of three by eight short crosspieces (mongǫmong) of äis, run from the canoe to the ends of the float and are fastened to the diagonals for strength. The number of these outer bent pieces is sometimes reduced to four, with two at each end of the float.

Two full-length pieces (kokǫn) of pür ęn wai (ilangilang) or mill-sawn lumber run along the top edges of the canoe from one end to the other, supporting the main crossbeams. These pieces are said to be recent additions. Above them four shorter runners (käithaith) now of mill-sawn lumber but formerly of kathai reach from the crossbeams to the ends of the canoe, and are often omitted today. When the four shorter runners are omitted, the seats (lŏ) of äpwith (Macaranga) are placed beneath the full-length runners; otherwise the seats are between them and the short runners. Äpwith is also used for three pairs of seatlike crosspieces at the ends of the canoe, lŏn'inap, which are third from the end and over which the diagonals pass, lŏnpwaus, which are second from the end, and, farthest out, lŏpu, which are fastened to the upper side of the top runners but which are usually omitted from the ordinary private canoes. On the carved district canoes a pair of figureheads (kęręk) of äpwith are placed at the ends of the canoe, their inner ends passing under the lŏpu and over the lŏnpwau.

Inside the canoe, between the main crossbeams, is a compartment in which food and clothing may be protected from the rain. The top of this compartment (thinap) is made of the buttresses or roots of the satak tree and also serves as a wooden platform for passengers or baggage. Formerly two other pieces (kĕu) of satak buttresses or roots, rounded to fit the inside of the canoe, were used as ends to the compartment, but these are generally dispensed with today. On the outrigger side a single piece (parän'ilok) of hibiscus forms the top part of the side of the wooden compartment, lying next to the inner side of the grass platform; this may also be omitted today. On the other edge of the canoe the top part of the side of the compartment is formed by three pieces. The lower one (läpinthakathok),

[3]Illustrations of the private canoe and the carved canoe from models can be found in Hambruch and Eilers, 1936, pp. 307, 308.

resting on the full-length runners, is made of hibiscus, the middle one (inap) is made of äpwith (Macaranga), and the top one (pąthilik) is made of pūlok (Xylocarpus) but was formerly made of hibiscus. On many of the private canoes today these three separate pieces are replaced by a single piece, which is sometimes decorated.

The sail (sărak) was formerly made of woven banana fiber but today the method of manufacture has been completely forgotten and imported cloth is used exclusively. The sail is triangular in shape and is fastened to "male" and "female" spars that serve as the yard (rasakamwān) and the boom (rasakąpwēn). The mast (kąu) serves simply as a prop to hold up the yard, which runs down to the end of the canoe body where it sits in a notch (pwāupwāu) cut for this purpose. The mast sits on the wooden platform (thinap) in the corner farthest from both the mast and the outrigger. The mast, the yard, and the boom are usually made of hibiscus, though bamboo is sometimes used today.

The direction of sailing is changed by moving the end of the yard from one end of the canoe to the other. The canoe is always sailed with the outrigger on the windward side, but the canoe is regarded as moving forward when the outrigger is on the right side of the occupants. Each outrigger lashing has its particular design and its own name, though knowledge of these is disappearing; sennit (pwęl) is always used for this purpose, and no substitutes have been found acceptable. For the rigging, however, imported rope and sometimes rope made locally of abaca (utisąl) has largely replaced sennit. Rigging includes the ropes (arŏląng) by which the sail is fastened to the yard and the boom, the lines from the yard to the outrigger piece (pwękitham), and the line (lī) to the end of the boom by which the canoe is steered.

Paddles (pathil) are made of pątakai (Hibiscus tileaceus), the third variety of hibiscus. Canoe poles (kątla) are made only of äis and āk (Rhizophora), hibiscus being too weak and kątięu (Ixora carolinensis) too short. Canoe bailers are made only of breadfruit (māi). Canoes are painted red with a black trim. The body of the canoe is rubbed with a red clay, and then painted with a quick-drying oil made from the äis tree; this paint was still widely used on Ponape for canoes even when imported paints were available.

SHELTER

A number of different types of Ponapean houses (īmw) were formerly built, all of which were rectangular in shape and had thatched gabled roofs. The dwelling house (īmwalap) was erected in earlier times on a stone platform (tāt), which was four feet high and carefully constructed of black basalt rocks. In the center was the pit (pąs) in which women cooked on the ground level, and in which the family sought shelter in time of war. Three large center posts, usually of āk (Rhizophora), supported the central beam, and along each side were three or four house posts of the large tree fern, katar (Cyathea) or less frequently āk. The outer house posts were set six feet apart, and the distance between them constituted a section (thinak), in terms of which the roof and the walls were made. Houses of commoners had only two or three sections in early times and no one except the major district chiefs, (A1-A4, B1-B4), section chiefs, and the nobility were permitted to have houses of four sections. The two highest chiefs (A1 and B1) had special houses (īmwanai) in which house posts, walls, floor, and all other wooden parts were of hibiscus (kalau). These had to be wrapped completely with sennit to protect them from the native bee (lǫngalap), which bores holes in hibiscus.

Thatching was usually of leaves of the ivory nut (ŏs) and less frequently of coconut (nī) leaves. These were split in two and in ordinary houses were bent over a piece of alęk (Miscanthus) and sewed with the midrib removed from the leaf. These strips were then fastened to rafters of hibiscus or äis so that they overlapped the strips below them. A floor of alęk was laid down on top of the stone platform, with three-foot pieces of alęk tied to a wooden framework of äis. The walls were likewise of alęk. As in the construction of canoes, all the joints were lashed with sennit, and nails were never used.

Today dwellings are simple, neat, cottage-type houses, usually with verandahs. They are frequently raised from the ground on a series of katar piles or posts, a type of construction that the Japanese also used. All dwelling houses had corrugated metal roofs before the war, though thatch was still used for cooking houses and feast houses. Iron roofing is preferred to thatch, not because it lasts longer, but because it is cleaner. Pan roofs, of the type sold by the Japanese, had to be replaced every three years, while well-made thatch lasts as long as five years, but continually sheds a dust that makes housekeeping difficult. Well-made thatch is as good as iron against the rain and thatch on dwelling houses presented no serious fire hazard because cooking was done in a separate structure. During the war many people had to return to the use of thatch on their dwellings. Eaves and waterpipes were also entirely of metal, though during the German period they had been of bamboo, as many were immediately after the war.

The modern houses were built of mill-sawn lumber and fastened with nails. The old-fashioned house lashings are to be seen today only in some of the few pre-war feast houses that are still standing, where they were used for traditional or ceremonial reasons. Most lumber was produced locally in the Japanese saw-mills, but a few Ponapeans imported lumber from abroad, and there was at least one house in Kiti District made of American wood imported in the German period. For house frames and most building purposes the best local wood is kǫtǫ (Sonneratia) because of its termite-resistant qualities and houses of this wood built twenty or thirty years ago are still standing. Thŏng, the wood which was very widely used by the Japanese during the war, is regarded as poor in quality because it is one of the woods most susceptible to termites and may last only three or four years. Other local woods have also been used for lumber.

At the end of the war there was a real shortage of houses, particularly in the northern part of the island where American bombers had been most active. To relieve the shortage, abandoned Japanese buildings that were not required by Military Government were assigned to the district administrations in whose territories they stood. District administrations in turn assigned the buildings to their members, and during the summer of 1946 many of the buildings were being torn down and the lumber, metal roofing, and other materials carried away to rebuild and repair former dwellings.

In addition to the dwelling houses, each family has a small cooking house (wąnŭm) nearby. This is made

entirely out of local materials and is used today for both men's and women's cooking. Some of the cooking houses may have been roofed with metal, but thatch was commonly used even before the war.

Canoe houses (näs ẹn war, ĩmw ẹn war) were usually made and owned by the section, and constructed to shelter the section canoe (wär ẹn kŏusap). They are also made of local materials. If they are large enough they can be used for private canoes (pänta) as well. Some families owned their own private canoe houses, but most private canoes were simply drawn up on the shore and covered with coconut leaves or discarded coconut-leaf baskets to protect them from the sun.

In earlier days feast houses (näs) owned by the section and by the district were also built on stone platforms like those of the dwellings, but of a different shape, the central pit for women's cooking being replaced by a large section (räs) at the back where the cooking was done. The stone platform covered the front half of the building and ran along each side to the back. In addition there were section meetinghouses (ĩmw ẹn kŏusap) and district meetinghouses (ĩmw ẹn wĕi). Before the war, some district feast houses had disappeared and the district meetinghouse served both for feasting and for discussions of district matters. Section feast houses and meetinghouses, built without stone platforms and often in a modified form, using mill-sawn planks, were still in use. During the war most of the section and district feast houses, meetinghouses, and canoe houses were destroyed without explanation by the Japanese when the Ponapeans were ordered to hide in the hills from American raids. In 1946 the canoe houses had already been rebuilt, the rebuilding of district meetinghouses and section houses was well under way, and Sokŏs District had rebuilt its feast house.

The small house in which the Chief A1 hid himself while discussions were going on inside the district meetinghouse, the special dwelling houses (ĩmwanai) of the chiefs, and the nearby houses (ĩmwẹnpäthok) in which visiting chiefs from neighboring districts slept, all disappeared when the chiefs lost their sanctity, and the house for young men had not been seen for about thirty years. In the Japanese period a new type of district house (ĩmw ẹn wĕi) was used. These were located in the Colony and used by members of the outlying districts when they visited the hospital, government headquarters, or came to the Colony for shopping or for business or social purposes. These houses were all destroyed during the war but other buildings were assigned the outlying districts by Military Government for this purpose.

SERVICES

Native magic and native cures are still employed on Ponape, but they do not run through everyday life as consistently as on Truk. Ponapeans have been acquainted with the benefits of Western medicine since the first arrival of American missionaries, when Dr. Gulick went to work administering smallpox vaccinations in the epidemic of 1853. The small German government staff included a doctor and the Japanese administration maintained a hospital in the Colony with a branch on Kusaie. Together these gave an average of 14,000 treatments a year to native patients between 1927 and 1937 and collected 5,995 yen in fees from natives in 1930. Two private dentists in the Colony served both the Japanese and native populations. The number of gold teeth (at 10 yen each) and gold fillings seen today indicate the extent of their native patronage.

Transportation facilities increased steadily as the Japanese colonization program developed. Early in the Japanese period there had been a ship only about once every six weeks and this was later increased to approximately a ship a month. From around 1935 on, however, there was an outward sailing from Japan about every three weeks, and the ships also stopped at Ponape on the return voyage after having visited the Marshalls so that a vessel entered Ponape harbor about every ten days. Japanese shipping was not only frequent but cheap. The freight for copra per shipping ton (900 kilos) from Ponape to Japan was 8 yen plus 2.60 yen for shipping charges, giving a total cost of only $3.00 per long ton. These low rates may have been subsidized in some manner.

Freight on other items to Japan varied with the nature of the goods, but was not far out of line with copra. Rates to outlying islands were the same regardless of the type of cargo. To Kusaie, which was served by the main shipping line, the charges were 3 yen (75 cents) for 900 kilos, whereas the other islands were served by special boats operating out of Ponape with higher rates. Freight rates could be kept low because the average wages for both Ponapean dock hands and Japanese crew was said to be about 60 to 80 sen a day, plus food.

Several of the trading companies operated small ships out of Ponape which called at the outlying islands to deliver trade goods and pick up cargo. The one owned by the Nänipĕi Company carried about twenty tons and had a wooden hull, two masts, and an auxiliary motor. In 1946 it lay rotting in the lagoon near Section K19 hopelessly beyond repair. When American air raids began, the Japanese had fixed it up as a decoy and anchored it in full view with logs placed on its deck to look like Japanese soldiers. It was sunk by American machine-gun bullets. The cooperative on Mokil had their own locally built boat with which they delivered copra to Ponape and picked up trade goods to take back.

Transportation to various parts of Ponape was also frequent and cheap. Before the establishment of Seisan Kumiai private traders operated their own boats and sampans to the outlying districts carrying passengers, picking up copra, and delivering trade goods. Their charge for delivering copra from the Kiti and Matälanim to the Colony was 10 yen per ton ($2.50). When the Seisan Kumiai acquired its own boat, the rates were reduced to 3 yen per ton from Section M26 to the Colony. The price set by Military Government for the delivery of copra for the same distance, from Section K19 to the Colony was 25 cents a bag (about 50 kilos) or $5.00 a ton. This price was one of the contributory factors to the delay in reestablishing copra production.

The Japanese provided intraisland shipping at low rates by using low-powered diesel boats ("pom-poms"), usually of one cylinder, which operated on low-cost "black oil." Black oil sold on Ponape by the Japanese for 8 yen a drum (4 cents per gallon). The Military Government rates were based on the use of the same vessels, abandoned by the Japanese, and on the stocks of black oil that were left on Ponape at the time of the American occupation. The remaining black oil was sold by Military Government for $4.00 a drum (8 cents per gallon) when neither copra prices nor wages had been doubled, and the official rate of exchange (20 cents

instead of 25 cents per yen) made the cost 250 per cent that charged by the Japanese. The costs of other Japanese fuels were also low. High-grade gasoline cost 50 yen a drum (25 cents a gallon), second-grade gasoline 45 yen a drum (22.5 cents a gallon), and red fuel kerosene 25 yen a drum (12.5 cents a gallon). Marine diesel engines for pom-poms sold on Ponape for from 60 to 100 yen per horsepower, regardless of size. The boats and sampans themselves were usually built locally. Some of the traders operated with small eight-horsepower pom-poms that consumed fifteen gallons of black oil (60 cents) on a round trip from the Colony to Matālanim harbor and back. The Seisan Kumiai boat was about fifteen horsepower and carried about a ton and a half, plus ten tons towed behind in a large sampan. This combination was adequate to handle all the Seisan Kumiai trade, which meant all the copra and trade goods for Kiti, Matālanim, and Ū districts. It worked for two weeks on the western side of the island between Kiti and the Colony, and then for two weeks on the eastern side, making four trips to Matālanim and four to Ū. On Monday and Tuesday the boat visited Matālanim, calling at the stores in Sections M24, M26 (from which the stores in M9, M14, and M18 were served), and M4, and returning to the Colony. On Wednesday it went to Ū and back. On Thursday and Friday it repeated its trip to Matālanim and on Saturday it again visited Ū. The same schedule was followed in the second week, after which it shifted to the other side of Ponape.

A number of the Japanese pom-poms and bonito boats were operating at the time of the surrender, though they were in need of repairs. The Japanese were repatriated from Ponape without having arranged to repair the boats. For several months, while the boats lay rotting and rusting in the harbor, permission to reclaim Japanese boats was denied the people of Ponape on the grounds that an inspection by American mechanics showed them to be beyond salvage. Later this position was reversed and some thirteen boats, including two from the fishing fleet which operated outside the lagoon, were reclaimed. They were in bad condition and seldom more than six or eight could be operated at a time, but for several months they were the only surface transportation available to Ponapeans except canoes, and on a number of occasions American officials had to rely upon them for their visits to other parts of the island.

The reclaimed pom-poms were assigned to district chiefs and to private individuals engaged in copra production, logging, fishing, and providing passenger service. Passenger service to Kiti District was irregular but fairly frequent, and was operated under a Military Government price schedule. In Matālanim and Ū the boat was referred to as the "district canoe" (war en wēi) and no fares were charged. A typical sight on Ponape was a pom-pom with up to eight canoe loads of passengers in tow. In the rain or the hot sun this is not a comfortable means of travel but it means that any slow boat can serve the passenger traffic regardless of its cargo or accommodations. The reclaimed Japanese boats helped through a period of crisis but could not be expected to operate much longer. Spare parts were not available and the supplies of black oil were almost exhausted.

Road transportation had never been developed except about the Colony and in Nęt, Ū, and Sokȫs districts, and under the Japanese it was mainly of a military nature. The possibilities of shipping copra to the Colony for export by truck had yet to be explored, but even if costs were no obstacle it would have to wait upon the construction of adequate roads and bridges. After the surrender, Japanese vehicles usually gave rides to natives, perhaps in an attempt to set a precedent that might embarrass their conquerors. The Ponapeans showed an avid interest in automobiles and the few who had been given instructions in driving showed themselves to be apt pupils. The large stocks of Japanese military vehicles on Ponape stood idle again because they were regarded by American officers as too far gone to be worth reclaiming. After eight months of standing in the Ponapean rains this was undoubtedly true, but at one time they might have been cannibalized and put to good use and at the same time would have provided training and experience for Ponapeans in operation and repair.

Electricity was provided in the Colony by a hydroelectric plant and two diesel-operated generators that served domestic and industrial needs. American engineers who inspected the plant differed in their opinions as to whether it was worth trying to raise the height of the dam and otherwise increase the water supply, or whether it should be abandoned in favor of a new site. The dam is small and was emptied in about two hours during the season of trade winds. Industrial power was generally supplied by the diesel plants during the daytime unless there was heavy rain. The hydro plant operated from about 6:00 to 9:00 P.M. and then shifted back to diesel. Electricity was cut off at 11:00 P.M. unless there was a ship in port, when it would be continued until 12:00 or 1:00 A.M. The hydro plant continued to operate on a part-time schedule after the Japanese withdrawal, and a number of native homes near the Colony had electric lights. Full responsibility for the plant and power lines was carried by a man from Palau.

Telephone service was maintained in the Colony, and a line running clear around the island made it possible to phone to the Colony from the outlying districts. In the Colony also were a number of refrigerating plants, some of which provided ice for household use.

Under the Japanese there was one bank, located in the Colony. This was patronized only by Oliver Nānipēi and one or two other Ponapeans. Most Ponapeans kept their savings at the Post Office and during the war they were forced to deposit a certain amount of their income in postal savings, which paid 4 per cent interest. The postal savings records were taken over by Military Government, but no settlement on them was made. The Seisan Kumiai made no provision for credit. After it was established a Ponapean could borrow only from his friends, although previously, in the Japanese period, he could borrow from private storekeepers on future copra deliveries. This custom lead to abuses on both sides. It is said that some Japanese store owners extended credit in this way as a method of getting farmers in their control for political purposes or to gain title to their land. On the other hand, some Ponapeans borrowed from one store and then sold their copra and spent their money in another. One Ponapean storekeeper lost 2000 yen in bad debts in this manner but was forced to continue to extend credit in order to keep his trade. The Germans recognized the dangers of credit to both honest producers and honest traders. They prohibited its extension to natives except those directly associated with trading firms and except in cases of unusual urgency (e.g., to repair or provision a ship operating on a fixed schedule). In the Spanish

period the stores had extended credit with little difficulty because there were only a few stores in the Colony and only Henry Nänipëi's store in Kiti District.

Social, religious, and educational facilities and preferences, habits, and taboos, as they effect consumption, are discussed in the following chapter.

5. ECONOMIC REQUIREMENTS

The immediate objective of the American administration should be the restoration of the prewar standard of living. This minimal goal is not to be taken as precluding development beyond the level attained under the Japanese as advances become possible. Acquaintance with new ideas should be encouraged and desires to try new articles or products should in general be facilitated.

There was a natural tendency on the part of Americans on Ponape to judge the Ponapean standard of living from conditions as they saw them in 1946. However, men in grass skirts, women on the streets in rags or only wrap-arounds, thatch roofs, and fire plows gave a completely false picture of prewar conditions. Regardless of its other effects, the colonization of Ponape by the Japanese made possible a very high standard of living for the wealthy Ponapeans and permitted even those with low incomes to satisfy their individual preferences through the wider range of foods offered for sale. Geographic isolation became insignificant as the factor limiting the standard of living, and wealth and income were correspondingly more important.

The picturesque era of the grass skirt and the little grass shack had ended. The Colony was a thriving little town with a number of well-stocked stores. Services and imported goods that depended on the large Japanese community for their support were available to all who could afford them. In the later years before trade was cut off by the war, almost anything that was sold in Japan could be purchased locally. The Belgian families found it unnecessary to order their personal requirements from Japan as they had been accustomed to do. Few Ponapeans were financially able to enjoy the full standard of living that was available locally, but at the same time the period from about 1939 to 1942 represented the high point of Ponapean financial prosperity. Even before this, most Ponapeans ate better food, wore better clothes, and lived in better houses than the average Okinawan immigrant.

After the end of the war, the standard of living on Ponape was so far below prewar conditions, for the poorest as well as the wealthiest Ponapeans, that there is no point in making a comparison. Not even the most chauvinistic could claim that the American occupation meant an improvement over conditions under the Japanese before the war. In the first half of 1946 conditions were unbelievably bad, even by comparison with other parts of the mandated area. Since no copra was purchased, most families were left with no source of cash income. The only ways of earning money were by working for Military Government and the U.S.C.C. or by selling produce to them for local use. The money earned through the sale of produce was negligible after the departure of the original occupying force. In 1946, $236.35 was spent by Military Government in February, but this dropped to $88.84 in March and to $12.28 in April. In the same months the payroll also declined from $3406.46 in February to $2060.55 in March to $1648.70 in April. The total amount of money coming in to the 5462 people of Ponape during these three months was $7,453.18 and this included the salaries of two Belgians, one of whom was the highest paid employee of Military Government. Even including the Belgians the average per capita income on Ponape was 45 cents a month or 1-1/2 cents a day.

This figure can be compared with the average monthly income per family on Palau in 1946 of $14.37, which was still a marked decline over the prewar period. On April 30, 1946 the net worth of the population of Ponape was calculated by the Finance Officer as $25,002.27. From this figure the following amounts must be deducted, $174.31 paid to people living on Ngatik and Nukuoro, $1322.84 owed but not paid to the people on Pingelap and Mokil, and $1000.00 paid to the Jesuit mission, leaving $22,005.12 as the total amount of money in the hands of natives and the Belgians. In other words, there was an average of $4.03 per person to replace all the goods that had worn out or been destroyed during the war. Most of the money was concentrated in the hands of the hundred or so employees of Military Government.

Even this small amount of money was of little value because, except for a few weeks in February when a U.S.C.C. representative visited Ponape, there were practically no goods for sale during the first half of 1946. When a U.S.C.C. representative was assigned to Ponape, there was so little to sell that there was no point in keeping the store, the only one on the island, open more often than once a week. It was not until after the middle of the year that consideration was given to the suitability of goods for local needs and local conditions or to prices. On Ponape, as in other parts of the area, prices were apparently unrelated to any conceivable factor; they were not consistent with the quality of the goods or with their purchase price, nor were they comparable to previous prices for the same items, and they certainly had no relation to Ponapean purchasing power. A carton of cigarettes, usually mouldy or watersoaked, cost two and a half days' wages; and a can of meat and vegetable stew cost more than a day's wages.

The financial straits in which the people of Ponape found themselves was the result of the disruption of the copra trade and of the Navy and Treasury regulations concerning the conversion of Japanese yen, which restricted the amount to be paid out in American currency to a maximum of $50.00 per person, regardless of the amount of yen surrendered. A total of $27,863.94 was paid out to the residents of Ponape, which at the rate of exchange that was used (20 cents per yen) is the equivalent of 139,319.70 yen. The amount surrendered was 626,002.60 yen. If these Military Government figures are correct, more than three fourths of the value of the yen surrendered was withheld from the people of Ponape, amounting to $97,337.58. Furthermore, the average prewar rate of exchange was closer to 25 cents to the yen (which is used as the basis of calculation in this report) than it was to 20 cents. Five cents a yen difference in the rate of exchange has meant the loss to the Ponapeans of more than they received, an additional $31,300 on the total amount of yen surrendered.

The financial position fluctuated after the end of April. In the first two weeks of May the money in Ponapean hands was reduced by $1,400, taken in by the U.S.C.C. store. During June and July the situation showed signs of improving with the return of the laborers from Kwajelein and Eniwetok and with the beginning of the U.S.C.C. purchase programs for handicraft and trochus shell, but this was offset by the inability to pay any Military Government employees for two months because the Finance Officer was withdrawn without replacement. Rectification of this situation ended a very critical period, but since the payroll and money from handicraft and trochus affected only about 5 per cent of the population, the solution cannot be found until the export of copra and fibers is reestablished.

If the situation was bad on Ponape, it was incomparably worse on the outlying islands, where there was no income from any source, there were no trade goods except during the short visit of a screening party in February, and on Mokil and Pingelap, after the Japanese yen were called in in February, there was no money whatsoever.

IMPORT NEEDS

It is obviously impossible to itemize here all the imported goods that entered into the life of the Ponapeans. This section is concerned only with some of the more commonly used articles and services, and cannot be taken as representing a full picture of the prewar standard of living or even as a complete listing of the essential requirements. These will probably become fully known only as services and imported goods can again be had on Ponape, and as the people buy or reject the items that are offered and inquire when others will be available.

Food.—Rice has been imported since the Spanish or pre-Spanish period and for a long time has been a staple food. It is probably inferior in food value to yams and breadfruit, for which it is substituted, but it has a place of special importance in the diet because it can be prepared quickly and stored easily. Ponapean families usually ate rice about once a day, generally at the morning meal, so that they could get out to the fields quickly. For the same reasons rice was a staple food in the meals provided for wage laborers. Employers found that breadfruit, even in season, took too much time to gather fresh every day and too long to cook by the usual methods. Rice was sold by the Japanese by the box, said to have been about 6 by 6 by 3 inches in size and to have contained about 5 pounds. According to informants, the price was 50 sen a box (2.5 cents a pound) for Japanese rice, the best grade, and 30 sen a box (1.5 cents a pound) for "China rice." A box of rice was enough for one meal for a household of ten people. Wheat flour has also been imported for many years and bread is preferred by the Ponapeans even to rice. A bag of flour, which is said to have contained about fifty pounds and sold for 7 yen (3.5 cents a pound), was sufficient for a household of ten for about three months. Biscuits were also imported, as well as canned milk and some canned beef.

Sugar, which the Ponapeans use almost entirely in tea or coffee on first arising in the morning, was an important item. Some people drank as many as five cups at a time, and usually two spoonfuls of sugar were used to the cup. These were American-sized cups; Japanese-type tea cups did not become common until about 1937. Sugar sold at 42 sen a kilo (5 cents a pound). Tea was sold at 50 sen per ball. The balls were about three inches in diameter and might last a family of ten for six months when stretched by the addition of leaves and bark. Salt, which sold at 20 sen a kilo (2.4 cents a pound), was used even more quickly than sugar. A pound might last a family of ten only two days, and the usual rate of consumption for ten people was about two pounds a week. During the war the Japanese made salt locally by evaporating sea water in iron pans over a wood fire. On one of the small islands of the outer reef off the eastern part of Kiti District, several of these pans set in concrete covered by a small thatch shed could still be seen. The locally produced salt is described as "sour" and is not liked by the Ponapeans though during the latter part of the war and the first year of American occupation they were forced to use it. There is no tradition of the manufacture or even the use of salt in the Native period. Ponapeans say they learned to use salt after contact, but today salt and chili pepper are very well liked. Black pepper was not bought in the store.

On the basis of these figures the amount spent for a household of ten for rice, flour, sugar, and salt would be about 180 yen ($45.00) a year. The amount which went for rice (110 yen) may be high since it appears that some morning meals were made entirely of warmed-over foods baked on hot stones the night before and thus rice was not eaten every day. Nevertheless, these four items are said to account for the largest part of a household's recurrent expenses.

Imports of these commodities to the Ponape Branch Bureau in 1936 when the native population of Ponape Island accounted for approximately half the total population of the Bureau were 1,054,848 pounds of rice valued at 153,615 yen, 39,490 pounds of sugar valued at 10,173 yen, and 33,590 pounds of salt valued at 2,264 yen; flour is not listed separately in 1936 but in 1937 an unspecified amount valued at 15,359 yen were imported. From these and other import tables for the mandated area, the following values of these items per pound can be calculated: rice 2 cents in 1930, 4 cents in 1936, 4 cents in 1940; flour 3 cents in 1937, 5 cents in 1940; sugar 4 cents in 1930, 6.5 cents in 1936, 5 cents in 1940; salt 1 cent in 1930, 2 cents in 1936. Retail prices for pounds, converted at 25 cents per yen, are given by the Japanese for Ponape as follows: rice (first-grade Japanese) 3.0 cents in 1932, 3.7 cents in 1937; rice (second-grade Japanese) 2.7 cents in 1932, 3.1 cents in 1937; rice (third-grade Japanese) 2.6 cents in 1932, 3.3 cents in 1937; flour (Takeshimishi) 3.8 cents in 1932, 4.3 cents in 1937; sugar 5.2 cents in 1932, 6.3 cents in 1937; salt 1.9 cents in 1932, 2.6 cents in 1937. The retail price of canned milk is given as 11.3 cents per can in 1932, 12.5 cents in 1937.

Textiles and Other Consumers' Goods.—Men's trousers (răuses) and shorts were generally of white drill. Khaki drill was sometimes used for trousers, but not for shorts. Some shorts were in green drill, of which several shades were sold in the Japanese stores, but most were white. Ready-made trousers costing 1.50 yen a pair or ready-made shorts costing 50 sen a pair were generally worn. Tailor-made trousers and shorts cost 50 sen a yard for drill and 50 sen for the services of a native tailor. Some men wore trousers of more expensive cloth, which could be bought at prices

of up to 2 yen a yard for black wool. Better grades of cloth were taken to Japanese tailors who charged 3 yen a pair. Dungarees were not sold by the Japanese but they have been known from the German and Spanish periods and probably even earlier through contacts with the whalers. Some Ponapeans were even surprised to learn that their native name (tängkĭri) is not a Ponapean word. Dungarees are highly prized, especially by the older people who remember them, because they are strong and wear well. When the word spread that dungarees could be bought from the Americans "everyone rushed to buy them."

Shirts (sẹ̆t) of blue denim are also liked because of their strength. Ready-made shirts were sold by the Japanese at prices ranging from 50 sen to 3 yen each. They were in attractive colors, usually striped, but they did not wear well. Some of the cheapest ones lasted only two or three months, if the same one was worn every day. Most men bought shirts costing about 80 sen, which lasted about half a year. Strength is an important criterion of clothing for Ponapeans, and Japanese shirts and trousers were both inferior to "Navy greens" in wearing quality. Tailor-made shirts costing 3 yen for the cloth and 50 sen for the services of a native tailor or 3 yen for the services of a Japanese tailor, were sometimes worn. Undershorts (sărmata), were sold by the Japanese at 40 sen each, and were similar to the white broadcloth undershorts issued by the Navy. Undershirts, which are known either as "singlets" (singilẹt) or "inside shirts" (sẹt ẹn lŏlẹ), also cost 40 sen each.

A man usually bought two shorts or trousers, two shirts, two undershorts, and one singlet a year. Singlets lasted longer because they were not always worn, but almost all Ponapean men wore shirts constantly, even when they were working on the farm. Some men bought three or four shirts and trousers a year, and others, described as "stingy," bought only one so that they might save their money. The average expenditure on these items was about 5.80 yen a year if a man wore trousers, or 3.80 yen if he lived outside the Colony and wore shorts. Boys started wearing trousers and shirts at the age of about five. In the Colony they wore them constantly, but in the outer districts they dressed up only to go out in public. Young men begin wearing underwear between 13 and 18.

Dresses (likăuli) or "woman's clothing" were made at home from three and a half to four yards of cloth costing about 30 sen a yard. Blues and reds are preferred, and yellow and orange are disliked because they are the color of turmeric and were the only colors for body decoration in the older days. Today they are out of fashion. Chemises (sẹ̆mi) were usually purchased readymade at 1.20 yen each. Both dresses and chemises were usually decorated with lace, which cost from 10 sen to 1 yen for twelve yards about three-eighths of an inch wide. Three yards of lace were required for each garment, and the grade most commonly purchased cost about 50 or 60 sen. The cost of dresses and chemises with lace amounts to about 1.35 yen each. Beneath the chemise a wrap-around or lavalava (likăutẽ) is worn; this is said to take its name "torn cloth" from the sound (tẽ) made by ripping a piece of cloth from the bolt in the early days when there were no scissors. The wrap-around requires one and a half yards of cloth, which the Japanese sold for 45 sen a yard, and it is untailored.

At home on their own farm, women usually wore only the wrap-around, but dresses and chemises were always worn in public both in the Colony and the outer districts. A woman usually bought four wrap-arounds, one dress, and one chemise a year, which cost a total of about 5.40 yen. Women begin to wear this costume at about the age of eighteen; schoolgirls between thirteen and eighteen wear bloomers or "women's trousers" (räuseṣ ẹn li) instead of wrap-arounds. Girls start wearing dresses in the Colony and, in public, in the outer districts at about the age of five, and bloomers at the age of thirteen. After boys and girls are ten years old they can no longer go about without any clothes, even in the outer districts.

Today some families start dressing their children as soon as they are born. Infants' clothing, which children wear until about the age of two, consists of a G string (waiwailọl) like that worn by the Mortlock and Kapingamarangi men, which serves as a diaper, and a long gown with sleeves, which is tied about the neck; both are made of imported cotton goods. When children are old enough to walk they are dressed in baby clothes. Small knitted shirts and trousers are made for boys out of imported yarn, and a tiny dress, chemise, and bloomers are knitted for girls or made out of cotton goods.

Shoes are worn by everyone in the Colony. The Japanese encouraged the wearing of shoes, presumably to safeguard health, but it is said that in all districts except Nẹt most people usually went barefoot and that women wore shoes less frequently than men. Low rubber-soled black canvas täpi, with a separate place for the big toe, were the most popular shoes because they were the cheapest. Prices ranged from 80 sen to 1.20 yen a pair, and the cheaper was usually worn. Wooden gẹta imported from Japan sold from 50 sen to 5 yen a pair, but ones made locally out of thŏng wood cost only 40 sen a pair. Gẹta were not liked and were seldom worn by Ponapeans, who say they do not "know how to walk with gẹta."

Imported white sneakers for men and women sold at 1.60 yen a pair. They were used by women as dress shoes for Sunday wear. The most popular dress shoes for men were white canvas shoes with leather soles, selling at 6.00 yen a pair, though some men wore black-leather or patent-leather oxfords selling at 7.00 yen. These leather-soled shoes were not worn by women. Men and women who normally went barefoot often had dress shoes to wear to church. Leather soles that squeaked were preferred, a standard of value learned from early contacts with the whalers. Some men poured a little kerosene into a new pair of shoes to make them squeak.

In the Colony, and with dress shoes on Sunday, men wore socks that cost about 50 sen a pair. Stockings were worn only by young women, and silk stockings were rare, the usual kind being long black or white cotton stockings that cost 80 sen a pair for a good quality. The special split-toe socks designed for gẹta and täpi were seldom used. Neither of these two types of shoes were liked by young women because they could not be worn with stockings and when they were used they were generally worn without socks of any kind.

A man bought about two pair of täpi a year, a pair of dress shoes about once every three years, and a pair of socks about every other year. A woman bought two pair of täpi each year and a pair of stockings and a pair of white sneakers for Sunday about every other year. The average expenditure for shoes for the people who wore them can be estimated from these figures

at 3.85 yen for men and 2.80 yen for women a year. Boys and girls do not begin to wear shoes for dress until about the age of ten, except in the Colony or in wealthy families. In the Colony even schoolboys and schoolgirls wore ordinary shoes all the time. Informants have stated that they have never seen anyone over the age of thirteen barefooted in the Colony.

The cost of providing trousers, shirts, dresses, underwear, everyday shoes, dress shoes, and stockings for a man and wife cost about 17.80 yen or, at 25 cents to the yen, $4.45 a year. For the many Ponapeans living outside the Colony who wore shorts instead of trousers and who went barefoot except on Sundays, the cost would have been 12.60 yen ($3.15) a year. This is less than the cost of a set of Navy "greens," which were sold at $2.25 for trousers and $1.50 for a shirt. These figures indicate something of the problem to be faced in adjusting wages and the price of copra and other produce so that Ponapeans will not suffer a tremendous reduction in real income because of the cost of American goods. Considering both the quality and price of Japanese goods, Belgian informants estimated that the yen was about the equivalent of $1.00 in American money, although it was actually exchanged at 20 cents.

In addition to these basic items of clothing, two-piece suits costing from 8 to 30 yen were owned by some men; these were worn in church, at certain feasts and ceremonies, and in the Colony. Jackets were always worn to church on Sunday but they were usually of white drill costing 4 yen ready-made. Neckties and detachable collars are worn with jackets and suits. Some straw hats (l'isarop) were imported from the outlying islands. White, red, and black hair ribbons were used by young women. Men's towels were usually small hand towels about eight by twelve inches which sold for from 10 to 20 sen (2.5 to 5 cents) each; some larger tufted bath towels about 18 inches by 36 inches were used, and these sold for 40 sen (10 cents) each. Few handkerchiefs were used, their place being taken for the most part by the small towels.

Imported cloth is used in making pillows and mattresses. Mosquito nets are essential; the type sold by the U. S. C. C. out of military surpluses was regarded as high in price but good in quality. The main objection was to its shape. Whereas it is meant to hang over a single bed, the type the Ponapeans desire is a circular net that hangs from ceiling to floor and permits husband, wife, and children to sleep together either on mats on the floor or in a bed. Cloth valued at 138,341 yen and clothing and ornaments valued at 51,930 yen were imported into the Ponape Branch Bureau in 1936.

Every family had two or three iron pots about a foot deep and a foot in diameter for frying and boiling. These sold for 5 yen each before the war and lasted as long as twenty years. Dishes came in matched sets of twelve, but most families had about twenty plates and twenty soup plates at 40 sen each, twenty cups and twenty saucers at 20 sen each, two platters at 60 sen each, and sugar bowls and other items representing a total investment of about 30 yen. Glasses sold for 10 sen each, most families having about twenty. In addition there were about twenty knives, forks, and spoons that were generally cheap in quality and easily bent.

Cigarettes were sold in packages of ten at the price of 5 sen a package before the war; after about 1942 the price was increased to 10 sen a package (5 cents for 20). "Golden Bat" was the favorite and far outsold another brand with a Japanese name. Some people smoked four packages a day, but the usual amount for smokers was a package of ten a day. Matches cost 5 sen (1.25 cents) for a package of ten "penny boxes" each containing 100 matches; Japanese reports give the price of matches as 10 sen in 1932 and 8 sen in 1937. A family used about a package of matches a week. Kerosene for lamps sold at 28-30 yen per drum for low-grade and 38 yen per drum for high-grade white kerosene (about 14 to 19 cents per gallon). A few people had kerosene table lamps, but most used the large hand-lantern type that sold for 3 yen (75 cents) each. The best variety, made of brass, sold for 12 yen ($3.00). Japanese reports list the price of toilet soap at 15 sen (4 cents) per cake in 1932 and 12 sen (3 cents) in 1937.

Simple curved combs for women, about four inches long and two inches wide, were sold for 40 sen each. The solid red, white, blue, and green American combs that were offered for sale were not liked as well as the imitation tortoise-shell combs sold by the Japanese. Color is unimportant for men since they use combs only in the house; straight combs of black, white, red, and other colors cost 3 yen each. Straight-edge razors sold for 3 yen each. Pomades in a variety of scents sold at prices ranging from 20 to 50 sen for a bottle of about two ounces.

Perfumes, perfumed oil, lipstick, face powder, mirrors, toothbrushes, books, paper, lamps, padlocks, clocks, umbrellas, bicycles, screening for meat safes, musical instruments, phonographs, records, phonograph needles, and other consumer goods were also imported. Phonographs sold for 30 yen and records for 1 yen each.

Unless carpentry and cabinet work can be started on an adequate basis, furniture will have to be imported. Sewing machines are also needed. Informants estimated that there were about seventy-five machines in Kiti District, most in poor condition. Most of the sewing machines were of German manufacture, though there were a number of American Singers as well; both those operated by foot pedals and by hand cranks were used. Sewing-machine needles, ordinary needles, pins, safety pins, thread, buttons, hooks and eyes, yarn, tape, lace, dyes, scissors, and similar items must be imported. Flatirons of the charcoal burning type are needed and, unless the local production of soap is reestablished on an adequate scale, laundry and toilet soap are essential.

Producers' Goods.—Knives or machetes were sold by the Japanese for 50 sen (12.5 cents) each and lasted about a year. During the war knives became very scarce, and American imports did not materially relieve the situation during the first year of occupation. An adequate supply must be on hand before the copra industry can be re-established. Knives are the tool of all work, and one is required for every adult male and female. The production of a single man, one just beginning the trade of blacksmithing, cannot be relied upon for an item so essential to the conversion to a peacetime economy.

Metal heads for coconut huskers, which lasted for a number of years, sold for 1 yen (25 cents). Metal digging sticks for men are also required for farming; these were iron rods about an inch thick and seven feet long, with a pencillike point at one end and a flattened and giving a two-inch chisellike blade at the other. A large supply of iron reinforcing rods was

available for conversion into digging sticks for women. Metal roofing, metal drums, and stovepipes for copra-drying sheds are required.

There is need for milk cows and ducks for breeding purposes on Ponape, and pigs are needed on the outlying islands to replace those destroyed during the war. A few air rifles and some shot for rifles already on Ponape are required for hunting.

The following items must be imported for fishing: metal harpoon heads for diving spears, metal heads for throwing spears and iron wire for making them locally, seines, twine for making seines and other nets, lead sinkers, fishhooks, fish line, and wire leaders.

Rope and sailcloth are urgently required for canoes. Light-weight sailcloth selling for 50 sen a yard and lasting about three years was most commonly purchased before the war. About 25 yards ($3.12) is needed for a Ponape type canoe. Before the war every family canoe had a sail, but these had either worn out or had been used up to make clothing during the war. The need for sails was so acute that one or two sails were made of the hems of mosquito nets of the military type, but most canoes were without sails.

Supplies used in the boat-building industry are listed below (p. 58). Even if locally made boats are not utilized in interisland trade, similar supplies are required for the whale boats used on Mokil. If the bonito fishing industry is to be re-established, power-driven fishing boats and refrigerating equipment will be needed. Chemicals, parts, and equipment are needed for processing copra and manufacturing soap if the Etscheit factory is to be operated or if a new plant is to be established. Sawmill equipment is required if Japanese parts for the existing plant cannot be obtained or if production is to be expanded beyond its present capacity. A simple machine is necessary to re-establish the local production of cheap buttons from ivory nuts. Needles, dyes, rouge for polishing turtle shells, and small knives for carving are necessary for handicraft. Carpenters' tools, sewing machines for tailors, flat irons for laundrymen, and tools for mechanics and shoemakers, and the supplies for these and other crafts are required. Some blacksmiths' and barbers' tools were available, but hand clippers, scissors, combs, brushes, mirrors, razors, and blacksmiths' tools eventually have to be imported.

Shelter.—The basic import requirements for housing are nails, hinges, and hardware, paint, and corrugated metal roofing. Number-30 pan roofing was sold by Japanese at 4.80 yen for a piece six feet long by two feet wide and was said to last about three years. A medium-sized house, about twenty-four feet long, with a verandah, requires about sixty pieces ($72.00). Other requirements include glass, cement, metal eaves and drainpipes, drums or tanks for water storage, faucets and water pipe, and electrical fittings, though for several years few people may have money to spend on some of these items. Except for a few special types of wood, the trees of Ponape's mountains and mangrove swamps should provide adequate lumber if the sawmills are kept in operation, but the full effect of the Japanese wartime logging operations upon the forest resources is not known.

Through Military Government's action in assigning former Japanese buildings for native use, the critical period in housing was passed, but since most of the Japanese buildings were of thŏng wood and since both the lumber and the metal roofing were old, this solution cannot be expected to hold for more than a year or two. Shortages of nails and hardware made the repair of dwellings and the erection of new buildings with salvaged materials difficult. Paint was very badly needed.

Health and Sanitation.—A small but well-organized U. S. Navy hospital in the Colony operated continuously since early in the period of occupation. For two or three days, when the American medical staff was suddenly withdrawn, it functioned with only local medical personnel. One of the Ponapeans, who was employed for many years in the Japanese hospital, was skilled in laboratory analyses. Another showed great promise as a dentist, and several women proved themselves to be good nurses. Several other women were licensed as midwives after a short course of training at the hospital. The natives from Ponape selected for medical training in Guam were not able to enter the September 1946 class because of faulty communications, but their record shows them to be one of the most promising native groups in this field in the mandated area.

The combined Navy hospital and dispensary in the Colony was giving free medical care at the rate of about 2,000 to 3,000 treatments a month. This was about double the Japanese rate and almost the equivalent of treating the total population of Ponape every two months. The possibility of continued medical services on this scale offers great hope. With the small populations that are found in Micronesia, it should be possible to wipe out completely some of the most prevalent diseases such as yaws and gonorrhea. Approximately half of the treatments were for yaws, but education is an essential part of such a program. One mother, whose baby's face was completely covered with open yaws sores, explained that since the poison was draining from its system there was no need for hospital treatment.

Intensive educational and sanitation campaigns are also required if intestinal infection is to be reduced. Most families erected the latrines required, under penalty of fine, by Military Government; but most family members continued to use the bush, leaving the latrines to gather cobwebs. Flies are another problem; the screening of homes is no solution since there are separate houses for cooking and food is often eaten out of doors. A number of families already had screened "food safes" that are used for storing food between meals, but flies swarm over the food while it is being prepared. More food safes and further education is probably an answer. As has been noted, Ponapeans appreciate cleanliness in the handling of food, and they refuse to eat anything that has fallen on the ground. Kava stones are carefully cleaned before they are used and the tip of a knife is cleaned before it is used to open a drinking coconut. Education regarding the danger of infection from flies and other sources of contamination should not present insurmountable difficulties.

If the Colony is to be rebuilt to a town of any size a water-supply system in this area would be feasible. For the outlying districts the most suitable solution to the problem of safe drinking water would seem to be the provision of an adequate number of metal drums for the collection of rain water.

The hospital in the Colony plus dispensaries in Rŏnkiti and Matălanim districts, which are already planned, would give adequate medical coverage for Ponape. For a time the Navy operated a hospital on Kusaie, but this was closed because transportation and

personnel were inadequate; this should be reopened. Ngatik, Mokil, and Pingelap were visited by medical officers on screening trips, but for more than six months in 1946 (February to September) there were no visits at all to these islands because of the lack of transportation. The success of any medical program for these outlying islands depends upon the transportation that is provided.

Transportation.—The provision of adequate low-cost transportation, both inter- and intraisland, is one of the major problems that must be solved if the native economy is to be restored. Upon it depends the future of copra and other exports. It also affects the cost of imported goods and the native standard of living. Whether or not Japanese freight rates or fuel costs were supported by hidden subsidies, it seems certain that copra cannot be delivered to Japan or any other market on American ships at the cost of $3.00 a ton, and that higher costs for delivering copra from the outlying districts to the Colony for export will also be inevitable if they are supplied on a normal commercial basis. If copra is sold on the open market, the return to the Ponapeans will be smaller at the same time that the cost of imported goods is higher. If the Ponapeans are not to be made to suffer a serious decline in their standard of living, freight on export commodities will have to be provided at far below cost, or the cost of transportation will have to be covered by subsidies. It is recommended that the same price be paid for copra throughout the island and that the cost of transport to the Colony be borne by the purchaser.

Although during the first year of American occupation both inter- and intraisland shipping was totally inadequate, the problem of providing adequate shipping in the future should be much less difficult than that of meeting Japanese costs. For export and import trade a ship every four or five weeks should be sufficient; beyond that period the problem of storing copra becomes difficult. If all copra from Ponape and Kusaie can be processed locally into soap a schedule of every two or three months would probably be adequate, with copra from the atolls in the Bureau stored on the atolls until shortly before the arrival of the ship. For interisland shipping within the Bureau, small sailing boats with auxiliaries capable of carrying about 200-300 tons, such as those used by the Japanese, have proved most suitable. Sailing is unreliable except during the period of the trade winds so that auxiliary engines are important. The possibility that a native service within the islands could be established using these or perhaps smaller boats should be given every consideration. The experience of the people of Mokil in this connection is worth noting.

Just before World War I the present chief of Mokil (equivalent of A1), George Higgins (now Military Government interpreter on Ponape), and about twenty others from Mokil went to Nauru as contract laborers. The chief was assigned to work with Chinese carpenters in repairing boats, while Higgins was set to work on machinery. The war forced them to remain on Nauru for four years. On returning to Mokil the chief made a small whaleboat that proved successful, and in about 1928 he finally received permission from the Japanese to build a larger, 20-foot, boat that was capable of sailing to Ponape and back. Still later he and his people came to Ponape where there was a sawmill and where wood was more plentiful and built a 40-foot boat of the same design which was cooperatively owned and operated. This was subsequently enlarged to 50-feet, when a 20 horsepower engine of the "pom-pom" type was added as an auxiliary.

The Mokil cooperative then hired a Japanese "engineer" and assigned the Mokil man who had installed the engine to act as his assistant. In two weeks the Japanese was fired and the assistant, having watched how things were done, became engineer. The boat operated between Mokil and Ponape for three years, carrying passengers, copra, and trade goods until the Japanese refused to issue fuel and ordered them not to sail because of the war. The boat was pulled up on the land, but it went to pieces and the sails were cut up to serve as clothing. Of the twenty smaller whaleboats that existed before the war, only ten were left and these were in bad condition because of the lack of paint.

The men of Mokil are known as skilled carpenters, able to build both houses and boats. Some of their 20-foot whaleboats were bought by the Nambo Company, by other Japanese, and by Carlos Etscheit for use on Ponape inside the lagoon. About ten men in Mokil were known as "Captains" and were said to be capable of sailing from Kusaie to Yap or to any of the islands in between using charts and a compass. The most famous "Captain" in the Ponape Branch Bureau, however, was a Mortlock man on Ponape who sailed only by the stars and waves in the old tradition of the Pacific. There were also six men on Mokil who could operate and make minor repairs on the Japanese-type diesel engines, a number of other Mokil men who were working for Military Government on Ponape, and one unemployed Mokil man had three or four years of experience working on machines in Japan.

Allowing for optimism and overstatements on the part of the informant, such a story of unassisted achievement holds promise for the development of the type of low-cost transportation that is required for the outer islands. For a 40-foot boat the following requirements were given: One keg of 2" galvanized nails, one keg of 2-1/2" galvanized nails, six 12-foot lengths of 1/2" copper rod, five 12 foot lengths of 1/4" copper rod, five pounds each of 1/2" and 1/4" copper washers, six gallons of white lead, four gallons of copper paint, five gallons of paint oil, five gallons of putty, three packages of okum (which the Japanese sold in a tight package six inches long and two feet in diameter), one coil each of 1" and 1-1/2" rope (Japanese coils were one foot thick and two feet in diameter), 80 yards of sail cloth (Japanese No. 8, about the weight of blue denim trousers), and a 40-foot mast. Other materials can be produced locally. On Ponape with the sawmill operating, construction would require about four months with twenty men working four eight-hour days a week, and spending Friday, Saturday, and Sunday farming, fishing, and going to church.

A boat of this kind could visit the nearby islands once a month, though the trade will require either several such boats or a larger vessel. The following schedule of expectation for sailing time for months other than those of the humid season was given by the chief of Mokil:

Eastern run	Outward bound	Homeward bound
Ponape to Mokil	2 days	1 day
Ponape to Pingelap	3 days	2 days
Ponape to Kusaie	7 days	3 days

Western run	Outward bound	Homeward bound
Ponape to Ngatik	1 day	2 days
Ponape to Nukuor	?	?
Ponape to Kapingamarangi	?	?

Although some Mokil whaleboats were bought and used within the lagoon on Ponape, they were not satisfactory for this purpose. Here a flat-bottomed type of boat is needed not only to be able to get over the reefs, but to prevent the boat from rolling over on its side if it is caught on the reef. A boat and sampan similar to that used by the Seisan Kumiai on Ponape should be sufficient to handle the trade in copra and imported goods, if it is operated on a schedule similar to that outlines in chapter 4. Two Ponapean carpenters were said to know how to build sampans and pom-pom-type vessels. Other boats to work within the lagoon are required for Oliver Nānipēi, who provided his own transportation for copra, and for those engaged in logging and fishing. If the bonito industry is re-established somewhat larger boats will be required for working in the open sea. In selecting American substitutes for any Japanese-type ships or boats, the cost of operation rather than speed should be the primary consideration.

Other Services.—Under the Japanese, electricity was a part of the life in the Colony; it was also the basis of the operation of the main sawmill, the Kohatsu refrigerating plant for bonito, and other industrial enterprises. The question of whether the present dam and hydroelectric plant should be improved or abandoned for a new location should be decided definitely after an investigation by a competent engineer. The Navy diesel power plant was inadequate to service the Colony and the hydroelectric plant has been too unreliable for Navy needs. One good power plant could serve all the needs.

Telephones entered into Ponapean life to a lesser extent than electrical service. They could be foregone without causing hardship or dissatisfaction, but telephone communication with the outlying districts would be useful for administrative purposes. Some of the district chiefs expressed their interest in repairing and maintaining the old Japanese lines if there were any assurance that instruments, switchboards, and other essentials would be available. They suggested that each district could be responsible for the poles and lines within its boundaries, in the same way that they are for roads and paths. During the first year of occupation an islandwide telephone system was out of the question because of inadequate transportation, supplies and personnel. Native administration could receive only minimal attention and even the small telephone system serving Military Government was frequently out of operation.

The services of barbers, seamstresses, laundrymen, tailors, carpenters, mechanics, boatbuilders, cobblers, and blacksmiths which were rendered by Japanese or Ponapeans or both before the war can probably be supplied entirely by natives in the future. The needs of the native community for the services of mechanics, carpenters, and boat builders must not be sacrificed to the demands of the American administrative establishment for trained native labor. Most of the men with experience in these three skills are now employed full time by Military Government, and there is no established provision for their release to work on Ponapean projects, either private or community. If Ponapean needs are to be adequately provided for, announcements must be made both to the employees and to the population in all parts of the island that they can be released from Military Government service for short periods for work on Ponapean projects.

No restaurants were established to replace those formerly operated in the Colony by Japanese and Okinawans. This meant such hardship for Military Government employees that it was necessary to make special provisions for feeding them, which will fill the most urgent need for restaurants. Food is never adequate in the Colony, however, and a restaurant, a market for farm produce, and a bakery would serve useful functions. At present there are provisions only for purchasing bananas and fresh fish.

Some sort of banking service is required to provide a substitute for the Japanese system of postal savings, a place of safekeeping for land deeds and other valuable documents, and a source of credit. All these services are lacking. Credit is essential for the restoration of the prewar economy. Some of the districts experienced real difficulty in raising the $500.00 suggested as a minimum investment in trade goods for the district stores. Oliver Nānipēi already has had trouble in employing laborers for his copra plantation. The lack of capital placed similar obstacles in the way of the development of bonito fishing, boat building, transportation services, the purchase of cattle, and all other activities that require initial investments. For the immediate postwar period Government loans are necessary.

Since private loans present dangers both to debtors and to creditors, they should be restricted, and the right to claim title to land on the basis of such loans should be prohibited if native rights to land are to be protected. For the period when loans from the American government will no longer be available, some form of credit union is desirable. In this the local branches of the Seisan Kumiai can play an important role and they should be educated to this new function. Within small groups of this sort the risk of each applicant for a loan is well known and the social sanctions of the group can enforce repayment.

SOCIAL AND POLITICAL STRUCTURE

The next decade will probably see important changes in the social and political structure of Ponape. The current discussions of feasting, first fruits, and other forms of tribute to the chiefs are associated with the questions of land tenure and taxation, and of rule by hereditary chiefs. The relationships among these various factors worked out by the Germans were thrown out of adjustment in the Japanese period and are now in ferment, with the American ideas of liberation and of democratic elections serving as the yeast.

The Germans transferred the ownership of land from the chiefs to the people and substituted a fixed head tax for the variety of forms of tribute to the chiefs, which were never as oppressive as in the Marshalls where a percentage of all copra earnings was taken by the chief. The economic privileges of the chiefs were restricted and defined, and thereafter the chiefs were paid by the government. The Japanese did not enforce these restrictions so that the Ponapeans paid taxes to the government and tribute to the chiefs. This situation continued and became the source of wide-

spread dissatisfaction to the Ponapeans, who wished to see a return to the German policy or something similar to it under American rule. The early Executive Officer's criticisms of hereditary rule, which he called unnecessary since the Ponapeans had been "liberated" and were under the democratic United States, stimulated the discussion of these problems and gave them a slightly different slant. The idea was not entirely new and foreign. Ponapeans were acquainted with Mokil where chiefs are chosen on the basis of their abilities instead of their clan, as the Ponapeans phrased it. Thinking along these lines will undoubtedly be strengthened in Ponape as more is learned about the American system of elections, in which there is interest.

The nature of the results will depend largely upon the course taken by Military Government in its relationships with the chiefs. Under the Japanese it appears that change was prevented by the strengthening of the position and power of picked chiefs, though the evidence on this point is not conclusive. However, outright attacks on the native system of rule, such as those by the democratic minded Navy Executive Officer or those of the Germans, are unwise. Changes toward democratic government should come in a democratic manner, from the Ponapeans themselves, with as little interference and influence by the administration as possible. Hereditary chieftainship may be obnoxious to the personal political feelings of American officials, but the American tradition also includes the principle that people have the right to decide their own destinies and to live their lives as they choose. In the present situation, where some change in the method of selecting and supporting rulers seems in the making, there is a real possibility that American standards of value can be satisfied on both counts without active interference.

In the meantime there is much that the native chiefs can do in the way of assisting in native administration. Military Government has shown indications of recognizing this fact, though earlier the entire political structure of section and district chiefs seems to have been very much ignored or avoided. In the past the Ponapeans who had any experience in government or adequate understanding of district problems were limited mainly to the hereditary chiefs, who were sometimes given special training before they officially assumed their titles. The Nänikẹn (B1) of Kiti serves as a case in point. He was trained from early childhood for his present position and has held it for twenty-seven years. He was an individual who knew the conditions in his district and could think in terms of the district as a whole. Through long experience he was accustomed to making decisions and seeing that they were carried through. Some of the older chiefs, in short, are remarkable men. It would be difficult to replace them and foolish to expect ordinary individuals with no training to do as good a job of representing the interests of the people simply because they had been democratically elected by secret ballot.

Not all the district chiefs have been good rulers. Some thought of the district only after they had taken care of themselves and their families. The others, however, can be of real service to both the community and Military Government during the period of readjustment and reconversion to a peacetime economy and until democratic leadership can be developed. Leaders have developed outside of the hereditary ruling group, such as Oliver Nänipẽi whose influence was islandwide. His interests, however, cannot be taken as the same as those of the commoners. He was a highly acculturated individual in many respects and spoke of Ponapeans ("the natives") in the third person. His influence was based on his wealth, his education, and the reputation of his father. Like other influential individuals he was made a part of the native system of chieftainship and was, in fact, the only person holding a title in two districts.

Both democratic leadership and the means to opinion and protest in general must be developed after the many years of taking orders without question from the Japanese. Given the proper circumstances and encouragement both can be expected to appear, perhaps within a relatively short time. But they will not be encouraged if administrators paternalistically determine majority opinion informally and rule accordingly, or if through their first-hand official contacts the position of the chiefs is strengthened.

The problem of utilizing the experience and the knowledge of the hereditary district chiefs without entrenching them in their present positions to the extent that normal development in the democratic direction is inhibited is a difficult one. It calls for the utmost in delicate handling, tact, and understanding on the part of the administrator, but the problem is one in which I believe the chiefs will show understanding and a willingness to cooperate. In general, meetings with district chiefs should be as public and as publicized as possible, and if they are held in the district instead of in the Colony more people will have a chance to attend. A newspaper or bulletin would be a good method of reaching the people, provided that it was widely circulated and read and that reports on meetings with the chiefs were full enough. On certain issues it may be advisable to follow up district meetings with discussions in the sections with the people and the section chiefs. The section chiefs are chosen from all classes and are not hereditary except in Ü District; it might be justifiable to refer certain issues to them.

Equally important is a reliable check on the reactions of both chiefs and commoners to these meetings and the proposals made by Military Government. Tact, and understanding cannot be exercized unless the reactions of Ponapeans to current developments is known. The full-time services of someone able to deal with peoples of totally different cultures from our own are required, and, as has been suggested in other reports, an anthropologist with field experience is best qualified for the crucial position. The need for reliable information on native attitudes and reactions is apparent both with respect to the relations with the chiefs and the problems of feasting, first fruits, and other forms of tribute.

SOCIAL NEEDS

Community life centers about the feast houses and the church. The restriction of feasts for the district chiefs may leave a gap in social life, but it will probably be filled by other feasts given by families and by sections of their own accord. It is not the feast to which the Ponapeans object; it is the obligation to give them to chiefs and visitors without any choice in the matter (see chapter 6). Under the present conditions there is a real need for islandwide social events.

The interdistrict trackmeets held under the Japanese have been revived by Military Government. Sometimes

they have been combined with native dances, which for many years have been given only as performances for foreign rulers. At first, trackmeets were held every month, but the chiefs felt this interfered with the economic life of the island and decided that once every two or three months would be often enough even though they are important and well-liked affairs.

Military Government allowed natives to attend their movies free of charge. These were patronized mainly by the people of Sokȫs and Nȩt, but those from outlying districts attended when they were in the Colony. Although only a word here and there was understood, movies were very well liked. Ponapeans and outislanders walked four and five miles each way to attend and they watched for the weekly plane, which usually meant that there would be movies again. Attendance at movies can also promote friendly relations between Americans and natives, although the behavior of enlisted men in the theater gave offense to Ponapeans. Movies are also a means of education, spreading knowledge of English words and phrases and American ideas and culture. Unfortunately about 80 per cent of the films were either detective or gangster pictures featuring crimes of violence. Action pictures are liked but gangster movies present a peculiar interpretation of American life and morals. There were too few films reaching Ponape to permit any selection. The number was inadequate even for the Navy personnel and a larger and more comfortable building for showing the movies was needed since half the audience had to stand throughout the performance.

Religion and Religious Facilities.—At the present time almost all Ponapeans are Christians (soulang). There are said to be between fifty and one hundred people on the whole island who are not Church members. These are the women (kathin wini) and men (sȫu wini) who still practice native charms and medicines (wini), the "holy men" (souwinani, aramas sarawi) who know the native prayers and incantations (winãni), and the two or three men (sȫupath) who have special knowledge of the Ponapean legends and tradition (pathapath).

The Christians are divided about equally between Protestants and Catholics. Before World War II the Protestants were under the Japanese Congregationalists of the South Seas Mission (Nanyo Dendo Dan) and the Catholics under the Spanish Jesuits. Nȩt District, which was closest to the seat of Spanish government and the Jesuit mission, is said to be entirely Catholic. Ũ and Sokȫs districts, the latter including the outislanders, are said to be about half Catholic and half Protestant. Kiti and Matãlanim districts are predominantly Protestant. Three sections (M28, M20, and M19) are said to contain the total Catholic population, sixteen, of Matãlanim District. In Kiti there are said to be from two to five Catholics in each section in the Wȩnę half of the district, and none in Kiti proper. The old Protestant-Catholic rivalries of the Spanish period have died out completely, and the priests and pastors no longer preach against each other's ways.

In 1943 Rev. Tanaka, who had been the head of the Protestant mission on Ponape for more than twenty-five years, was repatriated to Japan by the government, leaving the mission work in the hands of Rev. Asumi. When Rev. Asumi was evacuated with the other Japanese in 1945, the Protestant Church was left in the hands of two native pastors who conducted services at the Colony and in Kiti, of a mission teacher who conducted services in Õa, Matãlanim, and of ten other native teachers.

The principal Protestant Church building is an imposing concrete structure in the Colony, which was erected between 1930 and 1935 to serve the Protestants in Sokȫs District. It was built entirely by native labor, with the exception of one Japanese carpenter who was hired. Materials were imported from Japan and paid for with 20,460 yen collected by the Church members. This building escaped destruction during the air raids on the Colony, but was badly in need of repairs. A bomb fragment cut a hole in the side of the building, and damage resulted through the use of the church by the Japanese military as a warehouse and barracks from 1941 to 1945. The first postwar service held after the Japanese had been ordered out of the church by Military Government was Thanksgiving.

About 200 square feet of the concrete floor of the church were dug up by Japanese soldiers in building an air raid shelter, and all doors and windows were removed by the Japanese for building houses in the mountains. The school building, the pastor's house, and three houses of native schoolteachers were torn down by the Japanese military for building materials and firewood, and the dormitory for schoolgirls was burned in the air raids. At Õa the Protestant church, the boys dormitory, and the house of a native teacher were torn down for the same purposes, but the houses of the Japanese pastor and a native teacher, and the school building were left intact. The school is again used for services on Sundays and as a government school on weekdays.

Spanish Jesuits from a large part of the Carolines were concentrated on Ponape by the Japanese during the war. In addition to the Roman Catholic father and the sisters at the mission in the Colony, there are fathers at present in Ũ and in Kiti. The wooden churches in these last two places escaped destruction but were in need of repair, and like all buildings on Ponape, badly in need of paint. The main Catholic church in the Colony was a gaping ruin, hopelessly beyond repair. It is said to have been dynamited deliberately by the Japanese after it had escaped the air raids. Some of the nearby buildings were torn down and the ones that were still standing were in need of replacement. A native-type building with a thatch roof served as the school.

In spite of an extremely strict puritanical stand, the Boston Mission made a real contribution to Ponape and the natives would welcome its return. The Protestants would like two American missionaries for the Colony and two for Matãlanim District. In the early days the Boston Mission taught reading and writing in Ponapean, arithmetic, geography, music, domestic science for girls, and carpentry and agriculture for boys. Although education in these subjects was very elementary it was highly appreciated by Ponapeans. Under the Japanese system of compulsory education the Protestant schools trained Ponapeans as evangelists, but not all students became evangelists. Their courses provided further training for public school graduates.

The Catholics offered much less apart from straight religious teaching than did the Protestants, but American Catholic missionaries would be preferable to the present Spanish Jesuits. The language problem is a real one in view of the Ponapean's desire to learn English. According to a Navy Medical Officer, himself a Catholic, the standards of personal cleanliness of the Ponapeans were higher than those of their Catholic

teachers, and the worst sanitary conditions on Ponape were within the Jesuit Mission. Catholic missionaries are needed for the Catholic congregation, but both the Ponapeans and the Church would benefit from representatives who could provide leadership and instruction and set an example.

On Kusaie, where American missionaries from the Boston Mission were in residence until shortly before Pearl Harbor, some sixty students attended the mission school. In 1941 there were one each from Pingelap, Ponape, and Kapingamarangi. About half were Kusaians receiving a general religious education while the other half were Marshallese being trained as evangelists. Both Japanese and English were taught in addition to the Bible, weaving, and general subjects. There were also four church schools on Kusaie.

Kusaie is entirely Protestant and Protestant influence has also been strong on Pingelap, Mokil, and Ngatik where native pastors were in charge. Figures for 1937 which give the total population for the Ponape Branch excluding the islands in the Marshall chain as 9,369 show that there were 2,801 Catholics and 3,842 Protestants. This leaves 2,726 who presumably were non-Christians residing mainly on the atolls.

Schools.—Ponapeans have been acquainted with formal education for almost one hundred years, since the days of the first missionaries. In the course of this period they have had to learn four different foreign languages in succession, English through American missionaries and whalers, and then Spanish, German, and Japanese. Nearly all the Ponapeans now speak Japanese; a few of the older people speak German or English. A number of the older people, who cannot or will not speak English, can understand it fairly well. Undismayed by the fickle course of their past history or the fact that all the Japanese they have learned is now of no help in communicating with their new rulers, the natives are eager to learn English, now that the cycle has been completed.

Provision for the teaching of English should be made in the schools, but it should be reserved for the higher grades. Instruction in the lower grades, at least until students have learned to read and write, should be in Ponapean, except in Sokȩs District where the mixed population presents special difficulties. Ideally, separate classes in the different native languages should be provided here also for the beginning students. Experience in colonies in other parts of the world shows that instruction exclusively in a foreign tongue may be an insidious method of undermining respect for the native culture and traditions, with undesirable consequences. A too rapid departure from the old ways of life and a naive attempt to embrace the new usually result in disillusionment, unhappiness, and bitterness when the new ways cannot be fully achieved. A similar effect is the result, to a certain extent, of any type of education or contact with foreigh culture, but there are fewer ill effects when the process is gradual.

There is reason to hope that through the rapid turnover of ruling powers the peoples of Micronesia may have developed a certain skepticism that can serve to protect them. Ponapean culture has been modified, but it has remained, whereas things American, Spanish, German, and Japanese have come and gone. Nevertheless, the dignity and worth of native customs and traditions should be emphasized throughout any program of education, and there should never be ridicule or scorn of old ways of doing things even when they run directly counter to administrative policy. Where modifications of native customs are considered essential for native welfare, for example in connection with sanitary practices, they should be brought about by demonstrating the advantages of the new way of doing things and not by attacking the old. This method may be slower, but it will have fewer unforeseen and undesirable repercussions on Ponapean life and in the end will make for a more gradual, less disruptive, and better integrated adjustment.

Social change cannot be brought about simply through the schools except over a period of a generation or more and with the possible danger of developing a schism between the older and younger people. Where new ideas, such as those of sanitation, are being taught in schools, the chiefs and older people should be informed of what is being taught and given as much of an explanation of the new ideas and the reasons behind them as possible. If this is done successfully, to the extent where the older people become interested enough in the new ideas to follow what their children learn in school, the results of teaching will have a much wider influence.

"Elementary schools" for Japanese and separate "public schools" for native children were maintained by the Japanese government. There were five public schools in Ponape Branch Bureau, none of which was located on the atolls. There was a native school in the Colony, in Kiti, Matălanim, and Ü districts on Ponape and one on Kusaie. The schools offered a three-year "regular" course in which almost half the time was devoted to the study of the Japanese language, and the main public school at the Colony offered a two-year "supplementary" course in which a third of the time was spent on Japanese. Students were not taught to read and write their native language. The teaching staffs included a few Japanese-speaking native assistants, but consisted mainly of Japanese who met the standards for school teachers in Japan. Children attended school six days a week forty-eight weeks a year.

Boarding facilities were provided at the school in the Colony but the average number of students boarded between 1933 and 1937 was only fifty-five and in 1931 86 per cent were enrolled in the supplementary course. No Ponapean or out-islander was enrolled in the first year of the regular course. Although the Japanese stated that the boardinghouse was "for accommodating pupils from outlying districts" it was not used to assist children from the atolls to obtain elementary education. Free board and lodging were provided by the government in the boardinghouses, in addition to books, paper, ink, and other supplies which were issued free to all pupils. No tuition was charged. Although its ultimate objectives and the exclusive instruction in Japanese may be questioned, the Japanese program of native education was good in quality and in its broad character.

An official report for 1931 states that "Children of school age between 8 and 14 years are expected to attend school" and in 1935 the "regular" course was made compulsory. This change was not reflected in school attendance records. Compulsory education was impossible on the outlying atolls, but nevertheless 91.52 per cent of the children of school age in the Ponape Branch Bureau were in attendance at public schools in 1931. The percentage was much lower in 1927 (67.27 per cent) and in 1928 (65.06 per cent), but there was a marked jump between 1929 (66.67 per cent) and 1930 (90.23 per cent). By 1937 it had fallen

back to 65.08 per cent. The reasons for this drop after education had officially been made compulsory are not fully known, but it is related to the increase in the number of children of school age from 979 in 1931 to 1280 in 1937. The number of children actually in school during these years declined slightly from 613 to 599. In arriving at the percentages given above the Japanese counted as "in attendance" both those actually in school at the time (who were sometimes over 14) and those of school age who had completed the regular course. The numbers "in attendance" also declined from 896 in 1931 to 833 in 1937. On Ponape and Kusaie it can be assumed that for practical purposes all children completed the regular course in government schools.

The early American Military Government officers set up a system of schools, on paper, but the provisions for education were totally inadequate for the needs of Ponape. In each district from two to four school teachers were appointed who worked without pay until April 1946, when they were put on a salary of $5.00 a month. Classes were held in former school buildings or in abandoned Japanese stores, some of which are unsuitable for classroom purposes. School attendance was on a voluntary basis, and there was no provision for supervision of classes or curriculum. The primer in the Ponapean language which had been prepared in Pearl Harbor was not available on Ponape. There were no desks, no maps (geography is a favorite subject), no textbooks for pupils, and no paper or pencils. Some schools were fortunate enough to have blackboards in which case fifty or sixty students ranging in age from about six to eighteen, could take turns in working out arithmetic problems on the board.

Overcoming these obstacles is no difficult matter. It will be far more difficult to find an adequately trained teaching staff. Initially there was no provision for further training for Ponapean teachers, some of whom were attempting to teach English with only a small vocabulary and an almost unintelligible pronunciation. The teachers were fully aware of their own shortcomings, and were anxious to improve themselves. They deserve unreserved praise and credit for the way they tried to go ahead and do the best they knew how under circumstances that were impossible. It is truly impressive to hear a class of school children sing four or five verses of "The Star Spangled Banner" in absolutely perfect four-part harmony, a performance that is repeated for every visiting American. It is also impressive to hear a class recite in unison the names of all the countries of Europe and Asia, the countries of Africa, the countries of South America, and the forty-eight states of the United States in order of their geographical location. It shows little, however, of how much they understand about these countries or their peoples. The method of instruction, which is probably based on Japanese or earlier precedents, involves a great deal of memory work.

Carlos Etscheit was later appointed as an education officer by Military Government. He was to have responsibility for providing instruction for the teachers, for the development of a curriculum, and also for attempting to work out a standard system of spelling that can be adopted for the island as a whole. This last is an important task which must be done before education can really get under way and one which the chiefs have shown a desire to have accomplished. It is given added importance by the fact that Ponapean is a lingua franca in the Eastern Carolines and is understood as far west as Truk.

Orthography.—Two different systems of orthography are used, one by the Protestants in the south and the other by the Catholics in the north. The situation is further complicated by differences in pronunciation and to a lesser extent in vocabulary between the dialects, which seem to have roughly the same distribution as the two systems of spelling. The Protestants, who followed Gulick's dictionary but dropped all diacritical marks, use j whereas the Catholics used ch for a sound that is like s in the south and sh in the north. Thus land (sap) was spelled jap by the Protestants and chap by the Catholics; Hambruch, who did considerable work on the language, spells it tšap'. No instance was observed where the difference between s and sh was phonemic or anything except a difference in dialect, but Hambruch differentiates between tšap' (land) and šērăk (sail), and Von Hall indicates there are five different s sounds (s, ss, tsch, dsch, tss).

Phonemic differences do occur between two types of p's and m's. Thus there is the difference between pit breadfruit (măr) and title (mwăr) that is indicated by Gulick with m-mw and with m-mu by the Catholics, who completely avoid the w, as in spelling canoe (wär) as uar. This difference is not distinguished by either system when it occurs in the final position, as in sponge (lĭmw) and canoe bailer (lĭm). A similar difference between pig (pwĭk) and sand (pĭk) is differentiated by Gulick as p-pw, whereas the Catholics use p-b; Gulick does not differentiate it in the final position, as in drinking coconut (ŭpw) and fish poison (ŭp). The Catholic usage has some basis in that it is a transposition that is made in some English words (buying - pwäin), but it does not occur where the b is followed by another consonant (e.g., bread, black, etc.), and since it is not voiced, this spelling is misleading to Americans. The absence of voiced consonants seems to be a characteristic feature of Ponapean and is one of the difficulties encountered by Ponapeans in learning to speak English.

Phonemic differences also exist between n and ng, as in coconut tree (nĭ) and Pemphis acidula (ngĭ), which the Catholics indicate by n-ñ and Gulick by n-ń. There is also a difference between two kinds of t's, as in the District (Kiti) and dog (kithi); both of these are plosive but the position of the tongue is lower in the second. No difference is indicated by Gulick who spells cup (thăi) and an alternate name for pandanus (thăip) with a simple t, and it is possible that the difference is not phonemic.

The advantage of having a phoneme represented by a single letter seems to be outweighed by the advantages from the view of printing, writing, and reading of using the combinations m-mw, p-pw, n-ng, and if the differences are found to be phonemic, t-th and s-sh. In certain positions the distinctions are difficult to detect, and I may not always have accurately recorded them. K, l, r, and w seem to complete the list of consonants, all these are similar to the English sounds except for r in the initial and final positions.

The vowels are far more complicated; there are a number of diphthongs; vowels are considerably modified both in length and in quality by their position; and vowel length seems sometimes to have phonemic significance, as in the difference between sennit (pwę̆l) and dirt (pwę̄l).

The system of orthography used in this report has been designed primarily for reproduction by typewriter, and in it vowel length is indicated by the diaeresis (¨). The vowel symbols used here are a (father), ä (but),

e̲ (bait), ę̲ (bet), ı̲ (beat), i̲ (bit, except in the final position and in diphthongs when it is as in beat, regardless of length), o̲ (boat), ǫ̲ (bought), u̲ (boot). When shortened the a̲ and ę̲ both approach ą̲ (but) as in pwęţępwęt (white) and are difficult to distinguish, and it is possible that there is no ą̲ phoneme. The very short u̲ is like "put" while the short o̲ as in motomot (short) is different from any English sound. An attempt has been made to use one dialect consistently, that of Kiti District, which was spoken by the interpreter.

This system is basically the same as that of Gulick who indicates vowel length by a line (e.g., ā) and indicates the difference in vowels of "note" and "all" as ō and ō̲. It differs somewhat with the e vowels and the vowel in "but" which Gulick writes as ǭ̲. In the Protestant spelling on Ponape, diacritical marks are dropped, so that distinctions cannot be made between some vowel sounds. Diacritical marks are used profusely by Hambruch, but the Catholic system used only one (ñ). For vowels pairs of letters (aa, ou, ei) are used. It was not determined whether this indicates distinct phonemes or only vowel length.

It was not the intention of the writer to make a phonemic analysis of Ponapean and the orthographic system used here, particularly the symbols for vowels and diphthongs, should not be taken as the result of systematic linguistic work. The intensive study of a trained linguist is required to work out the vowel phonemes. Before an official orthography for the future is established the phonemes should be determined; otherwise there may be only further revisions and additional confusion.

Because there is a divided opinion on the question of spelling today it may not be difficult to introduce new symbols where these are desirable, rather than attempting to choose between the two sets in current use. From the writer's point of view, the system of double vowels and diphthongs to indicate length appears to be a useful device for representing vowel length, if this is to be distinguished, if it is understood that the double vowel means something different from what it does, for example in Hawaii. The use of ëi for what seems to be a simple long e has been followed here to make spellings conform somewhat to those in current usage. There seems to be a nonphonemic diphthongization of some long vowels in Ponapean, as in American. It also seems that the use of a false or nonphonemic y as a device to separate diphthongs from vowels would be a useful aid to pronunciation, as for example in kaiyęu (kaięu, first or number one), paliyais (paliais), inanwaiyas (inanwaias), and it might be useful to use w in the same way.

Vocational Assistance.—Vocational training is needed along with ordinary schooling. It is in this type of learning, in addition to reading, writing, and the use of English, that Ponapeans show particular interest and a remarkable degree of aptitude. The primary attractions of working for the U.S.C.C. were the classes in English and the fact that four or five natives were being taught to drive automobiles. This was more important to many employees in deciding to work as wage laborers than the money they earned. Vocational training for some may be coupled with wage labor in a sort of apprentice system, where instruction is given either by Americans or by skilled natives.

With few individual exceptions this type of training was not provided by the Japanese. One or two men from the Ponape Branch Bureau were sent to Japan for experience as mechanics and carpenters. By 1937 only five natives from the entire Bureau had attended the Apprentice-Woodworkers Training School established at Koror in 1926. About twenty boys between the ages of about sixteen and eighteen, recruited by the district chiefs with about four or five from each district, were employed by the Experimental Station where they were taught something of the Japanese techniques of agriculture. Ponapeans say that the Japanese were reluctant to teach them useful trades, and that even when they were employed by the Japanese they were taught only the essentials necessary to perform the work assigned to them. This is confirmed by Belgian informants, who said that the Japanese deliberately tried to keep Ponapeans from acquiring practical skills because they were so quick to learn that they were regarded as an economic threat. In the early days, skilled native artisans provided services not otherwise available to the small Japanese community, but as the program of colonization proceeded they became competitors of the increasing numbers of immigrant Japanese and Okinawan craftsmen.

Now a few individuals are skilled in repairing engines, in maintaining electrical equipment, in carpentry, boat building, shoe repairing, tailoring, and other crafts, but there is room for further education and a real need for spreading some of these skills over a wider group. Ponapeans can no longer hire Japanese to build their homes or make their houses, as some formerly did. Local blacksmiths, cobblers, and other craftsmen, who are just being established or who may be needed in the future, will require some training. The Mokil "Captains" are interested in learning the use of the sextant, which could easily be taught by the Navy.

Few natives had experience in bookkeeping, which is essential for native trade and stores, and very few had experience in the export or import trade. None had training in what we know as banking and credit, functions which eventually should pass to native hands. The typewriter was a new instrument on Ponape, and aroused the interest of a number of informants. Further opportunities for instruction in domestic science would be appreciated by Ponapean women, who were taught sewing and cooking by the missionaries.

Special Technical Assistance.—Special technical assistance will be required temporarily while the bonito industry is being re-established and the operation of refrigerators should be provided for. It will also be necessary if expressing coconut oil or the manufacture of soap is established in Ponapean hands. If copra is to be exported in the raw form in the future it may be possible to improve the present methods of drying, if technical assistance is provided. Native handicrafts can be improved by technical advice and instruction in the types of goods best suited to the markets. In this field the Japanese provided instruction before the war by bringing craftsmen from the Marshalls to instruct the Ponapeans, and by arranging classes under some of the skilled individuals.

In the field of agriculture the Ponapean population as a whole can benefit from scientific guidance, but the mistake must not be made of assuming that they are ignorant in farming or that their practices have no reasons behind them. Before an agriculturalist begins to tell them how things should be done, he should spend six months at the least in studying the present practices, their relationships to the crops,

the local conditions, and the social and economic structure.

Agricultural instruction of adults can well be coupled with a program where children learn new techniques by engaging in farming at school. This is a program which could be started immediately, using the traditional Ponapean methods of farming and bearing in mind their sexual division of labor. Such a plan has the advantage of preventing children, taken from the farms for an education, from losing contact with the basic means of livelihood. Competition in yam growing, and in other crops as well, could be used to stimulate interest.

REQUIREMENTS OF UNITED STATES MILITARY FORCES

It is understood that the military establishment will consist of about eighty men, some of whom will have their families. Most of these will undoubtedly be concentrated in the Colony and there probably will be no Americans stationed on some of the islands. A group of this small size should have little economic effect on the Ponapeans and there seems no reason why they should attempt to be self-sufficient. They can use fresh fish, crabs, shrimps, pork, fruits, and vegetables on the island without depriving the Ponapeans of food. Income from this source will be but a negligible amount compared with the money formerly earned by selling produce to the 14,000 Japanese who were evacuated.

All procurement of produce should be strictly on a business basis. If produce is offered as a gift under circumstances where payment in cash would be an insult, a return gift of equal value should always be made on an appropriate occasion. The only incentive for bringing produce to the Navy mess should be the money received in payment. Official or personal requests for produce that a Ponapean feels he cannot refuse, even though it may interfere with his regular activities, should be avoided, as well as circumstances in which the one who brings produce expects a favor or preferential treatment in the future. An adjustment of prices on all produce is required to provide this incentive.

Land requirements of the military establishment will undoubtedly be so small that they will represent no burden upon the native population, but as a matter of principle they should be kept at a minimum and excess government lands should be returned to the people.

PONAPEAN CONSUMPTION VERSUS REQUIREMENTS

On Ponape the food requirements can be satisfied largely by local production. The amounts of rice, flour, sugar, salt, and the like which must be imported are small but important in the eyes of the inhabitants. The situation on the atolls, where agriculture and the growing of domestic animals is more difficult, is less favorable. The picture is also completely different on both Ponape and the atolls with regard to clothing, metal tools, dishes, glasses, cutlery, medicines, matches, nails, metal roofing, machines and engines, and other manufactured goods for which there is complete dependence upon outside sources of supply.

6. PROPERTY

The concept of ownership is clearly defined on Ponape and property rights within the group are carefully respected. Most tangible goods fall in the category of private property, but some are owned (ŭtha) by sections and districts. Except perhaps in Ü, no property was owned by any of the kinship groups, the family, the subclan, or the clan.

REAL PROPERTY

In the native period all land was owned by the district chiefs. Kiti District was divided between the two principal chiefs, with the Nänikẹn (B1) owning Wạnẹ and receiving first fruits from Sections 1-14 and the Nänmăriki (A1) owning Kiti proper and receiving first fruits from Sections 15-36. In Matălanim and Ü districts all the land was owned by A1, or perhaps by A1 and B1 jointly; first fruits were presented first to A1 and then to B1. The same pattern held in Nẹt and Sokȩs districts, with due allowance for the former differences in district titles. The land belonged to the chief in his official capacity and was not his private property or the property of his clan. At his death it passed to his successor in office, and not to his son who inherited his private property (except in Ü where inheritance was matrilineal). Members of the chief's clan had no special authority or right to receive "first fruits," except by holding a title.

Commoners and other members of the district held (kŏa) their farmsteads as tenants (kŏaki). Some of the higher ranking district chiefs (presumably A1-A4, B1-B2) were permitted to have tenants of their own on their own farmsteads, collecting first fruits from their subtenants and calling upon them for food when a feast was being given. It is not known whether this was related to the practice, in a very limited number of cases, of giving outright title to small pieces of land to district chiefs as a reward for distinguished service in warfare. Commoners were not allowed to have tenants. If any stranger were allowed to share a commoner's farmstead he became the tenant of the district chief, to whom the arrangement was reported through the section chief.

An individual established his own farmstead by clearing a piece of land and planting breadfruit or coconut trees on it. When the trees had been planted, the individual reported to the section chief who informed the district chief what had been done. Theoretically the district chief could refuse to allow any man to live on his land, but actually there were seldom if ever any objections. The land that had been cleared was included as a part of the section and recognized as the farmstead (paliẹnsap) of the man who had cleared it.

The theory of land tenure was based on ownership of the crop by the individual who planted it. Since coconut and breadfruit trees may bear for sixty years or more in good soil, planting them gave a man tenure and security in his land for his lifetime. His claim was strengthened by building a house on the farmstead and it could be extended further and further into the future by planting new coconut and breadfruit trees every few years. His rights to the land were not confined exclusively to the land that he had cleared and planted, since farmsteads included uncut areas from which he could obtain hibiscus and other wild plants. These areas could be cleared and planted later, permitting a rotation of land with fallow periods in between. Natural features such as streams, stone, ridges, and trees marked the boundaries of the farmsteads.

The individual's rights to his farmstead were clearly recognized. Walking through the farmstead was not regarded as trespassing, but no one could pick any of the cultivated or wild plants that grew there or plant inside its boundaries without obtaining permission. If anyone planted on a man's farmstead without permission, the tenant informed the district chief and the intruder was ordered off, forfeiting his crops to the tenant. The tenant's crops were his own private property and could not be appropriated against his wishes even by the chief. The tenant had the right to use the land as long as he wished and to pass it on to his heirs. He could be dispossessed of his land only for failure to pay his rent or tribute in the form of "first fruits," for disobedience or disloyalty to the chiefs or violation of the taboos surrounding them, or for a crime, such as murder, serious enough to justify his being exiled from the district. In such circumstances he forfeited his crops and his house to the district chief, and was forced to take new land under another district chief.

The land in the mountainous interior also belonged to the district chiefs. On the uninhabited hillsides each family made its mountain farm. Mountain farming was on an annual cut-and-burn basis with a new field cleared and planted each year and the old one abandoned as soon as the crops had been harvested. Land tenure in the mountain farms was based directly on the private ownership of the crops. The individual's rights to the field as well as his interests in it ended as soon as the crops had been harvested. Anyone was then free to use the land, but no one was interested in doing so until it had lain fallow for several years since large tracts of more fertile mountain land were available. It was unnecessary to obtain permission from the district chief in order to make a mountain farm, or even to report it to the section chief. The fresh-water marshes were similarly held; they were owned by the chief, and the individual owned only the Cyrtosperma he had planted. However since the marshes did not lose their fertility, a man usually replanted in the same area year after year.

Property rights outside the farmsteads extended only to the land itself, which was owned by the district chief, and to cultivated crops. Anyone was free to harvest wild Cyrtosperma in the marshes, to gather wild bananas, breadfruit, mangoes, "Western yams," and other wild fruits and vegetables in the mountains, to hunt wild birds, pigs, and chickens, and to fell trees for canoes or house building, so long as the cultivated plants and privately owned livestock of others were not injured. Similarly there were no private rights to mangrove swamps, to the lagoon, or with three exceptions, to the reefs. Private fishing rights were recog-

nized in the case of fish weirs, fish traps, and turtle bait so long as these were in use. Otherwise everyone was free to fish, gather shells, catch crabs, or take wood without restriction.

The native system of land tenure continued through the Spanish and into the German period, when private titles to land were issued so that each man owned his own farmstead. The date at which this was done is not known, but it is believed to have been late in the German period, perhaps about 1912. The limits of each farmstead were set off by boundary markers (pẽs), which the Germans showed the natives how to make out of large piles of black basalt rocks. German law permitted the farmsteads to extend 99 feet out from the shore, but no consistent pattern was followed. Some farmsteads included sections of fresh-water marshes, marked off by piles of basalt, within which outsiders could not plant without the owner's permission; and some included sections of mangrove swamp within which anyone could fish but no one could fell trees without permission. Many farmsteads, however, stop at the edge of the shore.

The deeds that were issued not only transferred ownership of land from the chiefs to the people, but also regulated the system of inheritance, restricted the transfer of land, restricted feasting and district work for the chiefs, and defined public work. They also limited the punishment that chiefs could impose for disobedience and the right of the chiefs to exile people from the district, that is, their right to expropriate the land. The title provides that for insubordination the Nānmāriki (A1) could impose five days labor for the first offense and ten days labor for the second offense, unless the offender were incapable of hard labor, in which case a German official would set the punishment. For a third offense the Nānmāriki could propose to the German official that the offender be banished from the district. These punishments were for disobedience of just and lawful orders (gerechten Befehle) of the Nānmāriki. It is apparent that an individual could not be exiled for failure to observe the old taboos, to give first fruits, or to make more than one feast for the chiefs each year.

Before the deeds were issued the boundaries of the farmsteads were adjusted to allow sufficient land for copra production and each family was required to plant 100 coconut trees. It is apparent both from the document and from the statements of informants today that the Germans were attempting to do two things. They intended first to improve the lot of the commoners by restricting the economic privileges of the chiefs; and second to establish a sound economic basis for the native economy by giving each family a farmstead large enough to assure an adequate supply of food and to provide a steady cash income from copra with which clothing, kerosene, tobacco, rice, and other imported items could be purchased.

In line with this the deeds state that land cannot be sold, leased, or given away by the owner without the permission of both Chief A1 and the Governor, and that farmsteads cannot be divided among several heirs. This last provision was designed to prevent individuals from inheriting small, widely scattered pieces of land that were uneconomical to farm. The deeds provide that one heir only shall inherit, but that all landless male and all unmarried female relatives (the Ponapean translation says "clan members") shall live on the land and farm it for the common good of the group. It was apparently the intention of the Germans that, when families became too large for the original farmstead to support, new farms adequate in size to support a family would be established. The deeds provide that anyone who wishes to take unoccupied land for which no deeds have been issued may do so with the consent of Chief A1 and the Governor.

The deeds state specifically that all land for which titles have not been issued belongs to the district within the boundaries of which it lies. This point was not clearly understood by some Ponapeans, who felt that since they had been given their own land, all the rest belonged to the government. They did understand, however, that they could establish new farmsteads and that they still had the right to use unoccupied lands. They continued to hunt and gather wild foods, make mountain farms, grow Cyrtosperma in the fresh-water marshes, and fish in the mangrove swamps as before.

Under the Japanese, the German system of land tenure was maintained in its outward form, though its principles were markedly changed later on in actual practice. The Japanese announced that what had formerly been district land was the property of the Japanese government. This included the large areas in Palikir expropriated from individuals exiled to Palau by the Germans; this land was leased to immigrant Japanese colonists. Informants say that deeds to native farmsteads were called in and Article 6 was struck out. This is the Article providing that all land for which no titles have been issued belongs to the district, and that whoever wishes to take part of it as his own may do so with the consent of Chief A1 and the Governor. Families whose lands were taken for military purposes were obliged to rent land from the government. They could acquire land of their own only by purchasing it from some other native. In this they were treated no differently from the Japanese, but in effect a limit was set upon the amount of native-owned land. Native landholdings might be decreased by transfers to the government or sales to Japanese individuals, but there was no provision for their increase.

Ponapeans were not allowed to hunt or fell trees in the mountains without a license. Licenses were also required to cut trees in the mangrove swamps, to gather trepang on the reefs for export, and to catch turtles. Land for mountain farms and the fresh-water marshes had to be rented from the government, and in time the best of the latter were taken by the Japanese for rice growing. Families who did not have marshy land on their own farmsteads abandoned the cultivation of Cyrtosperma completely. A few landless families rented land, but most gave up mountain farming and grew all their produce on their own farmsteads. As a result more of the land on each farmstead was under cultivation each year. There was less time for the land to lie fallow, soil exhaustion was accelerated, and larger quantities of imported food, particularly rice and wheat flour, were consumed.

This extremely oppressive land policy seems to have been adopted subsequent to Japan's withdrawal from the League of Nations. In Japan's report to the League in 1931 only 3,035.5 hectares or 6 per cent of the total area of the Bureau is listed as State Domain, of which 3,010.6 hectares were for miscellaneous purposes (including plantations) and only 14.6 were for government use and 10.3 for public use. The date at which the change occurred could not be determined, but it is probably correlated with the program of colonization beginning in 1934 and with the increasing number of immigrants after 1938. The last occasion

on which unoccupied lands were given to natives is said to have been in 1921, and even at that time not all the landless families were provided for. At the end of the war more than sixty families in Nęt and even more in Sokǫ̈s District were without land and had to share the farms of parents or friends.

Land tenure is one of the most urgent problems facing Military Government. Until questions of land ownership have been settled there can be no return to a normal peacetime economy and there will still be landless families on an island that supported more than three times as large a population both in the Japanese and in the Native periods. A great deal of work is required before all the questions can be settled completely, but certain steps require immediate action. Title to unoccupied district lands should be returned to the district. Provision should be made immediately for establishing new farmsteads on this land with full title issued jointly by Chief A1 and the Commanding Officer. If the Japanese could take the land for the government with no more than a declaration, it should not be impossible to return it in the same manner.

The Ponapeans were told that all Japanese land belongs to the American Government, with the result that no Cyrtosperma was grown and no mountain farms were made during the first year of occupation. Just before leaving Ponape I suggested to the Commanding Officer that since no permanent tenure to land was involved in these two types of farming, right to resume them could be granted without even waiting for the return of the land to the districts. Military Government permitted Ponapeans to farm Japanese-owned land on the understanding that the arrangement was only temporary and that title still remained with the American Government.

Both the Ponapean and the German systems of land tenure were sound and workable, and made adequate provision for the acquisition of new lands by expanding families. There is no point, however, in even considering a return to the Ponapean system of land tenure at the present time. The change to private landownership is a completed fact. It was accomplished with little if any dissatisfaction. Ponapeans today readily express their gratitude to the Germans for the change and even the chiefs say it was for the good of the island. The German system of land tenure, possibly with some modifications of the rules of inheritance, is a sound basis for future American policy. Certainly nothing like the policy practiced by the Japanese in the latter years is acceptable.

When the Colony was burned by American incendiary bombs, the Japanese records of native landholdings were destroyed for all districts except Matālanim. The records of Japanese-held lands were preserved for several districts, but they were kept without cross references or indexes and require a great deal of tedious work to unravel. Most of the original land deeds issued by the Germans were still preserved by the Ponapeans, though these do not define farmstead boundaries. The picture was still further complicated by Japanese purchases, sales, and leases of land and by shifting of farmstead boundaries. At one time, when the Japanese issued an order that all farms should be cleared, they announced that if any native did not clear his land, his neighbors could come in and do so and keep it as their own. As a result boundaries that had been straight became crooked and on a farmstead where there were formerly twenty boundary markers there may now be sixty.

A complete land survey is essential because of these practices and because of the destruction of land records, although one had just been made by the Japanese in 1942 or 1943. Through the section and district governments, Ponapeans themselves can do a great deal in the way of preparing the ground for the survey. They can work out a list of the farmsteads, their locations, and their approximate sizes. They may be able to agree whether the original German boundaries should be re-established or, if not, what types of boundary changes are to be honored. Neighbors often may be able to agree between themselves how their common boundaries should be drawn. Work along these lines could be begun at once and given final approval later. This would be the best way of solving these land questions, not only because it would reduce the demands on American personnel, but also because it would insure full Ponapean participation in solving problems that are primarily their own concern.

Private ownership of crops and trees, which was the theoretical basis of land tenure in native times, is a strictly individual affair. Husband and wife separately own the crops that each has planted, and their ownership continues until the crop is harvested and served as food at a meal. Houses are also private property, belonging to the head of the family, who owns the land on which they are built. His children, his wife and her clan members, his own clan members, and his friends who assist him in building the house and who share in its expense, have no right to tell him how it should be administered. The same is true of pit breadfruit. When a house or a fish weir is made by a section or district, however, it remains the property of the group, administered by the chief.

Formerly, and still occasionally today, the umbilical cord of a newborn child was buried in the ground and a new coconut or breadfruit tree was planted over it. It is believed that both the tree and the child will grow up together to be strong and healthy, and that injuries to the tree will affect the child. Until the child is about twelve years old, cutting a branch off the tree is thought to be like cutting off the child's hand. In the early years also, only the child can eat the fruit of the tree. After he is old enough to "have sense," a child decides for himself whether he wishes to allow others to eat from his tree or to keep the fruit all to himself. At this time also the tree can be cut down without danger to the child.

MOVABLE AND INTANGIBLE PROPERTY

Except for the section canoes, section seines, and perhaps the former district canoes, all movable property was privately owned by individuals. Each paddle, grass skirt, basket, knife, mat, fishnet, fan, and the like belongs to a specific man, woman, or child. Each individual knows how many pigs and chickens he or she owns and can recognize them at sight and tell them apart from those of his neighbors. Even the products of cooperative labor by clans are the private property of the husband of the family for whom the work is done. Neither the members of the husband's clan, nor the members of the wife's clan, nor the members of the family who have helped in making a canoe or a seine have any right to interfere in his decisions as to their administration or any power to veto them. Ownership of private property carries with it the exclusive right to loan, sell, give away, throw away, or even destroy an object.

A striking characteristic of Ponapean property in the native period is the short time it was expected to last. Few moveable objects other than the old style mat (lōs), the war spears, and the cowrie-shell breadfruit peeler (pwĭlĭąmai) lasted more than five years. Digging sticks and breadfruit sticks are thrown away at the end of each season and many artifacts are thrown away after having been used only on the occasion for which they are made. With the exception of certain items of producer's goods, this was also largely true of imported Japanese goods.

Legends (pąthąpąth), native prayers (winăni), and medicines (wini), were carefully guarded secrets. The medicines were taught to a daughter by her mother and the legends and prayers to a son by his father after the family had retired to the privacy of their bed, where no one could overhear them. Men took considerable pride in their knowledge of legends but were extremely reluctant to tell them for fear they might become public property. A similar attitude was shown toward the prayers and medicines or charms with which certain individuals earned gifts (lsăis) as specialists. All of these are less important now than they were formerly. The discoverer of a new variety of yam is said to feel a proprietary right to the name that he gives it, and is displeased if another name is used for his yam; nevertheless a number of varieties are at present known by two different names. A song can be sung by anyone without asking the composer's permission but the composer is angered if the words or tune are changed.

INHERITANCE

Except in Ŭ District inheritance was patrilineal. Yanaihara and others, who have ascribed matrilineal inheritance to the whole of Ponape, have confused the inheritance of property with membership in the clan and the succession to chieftainship. Both of the latter are matrilineal throughout the island, whereas in four of the five districts property passed from father to son. At the request of Military Government, the district chiefs and representatives were attempting to codify native customary law and standardize it as much as possible for the island as a whole. The representatives of Ŭ District were the only ones who were holding out for matrilineal inheritance of property.

In Ŭ District, the farmstead was kept within the clan. When a man died his land was usually divided among his brothers and after them passed to the sister's son (wăwa). Women could not hold or inherit land. At a man's death two baskets, called "Knot baskets" (kĭampuk) were sent to Chief A1 to "tie the land" to the heirs. In one basket there was a drinking coconut from each of the brothers of the deceased, and in the other a drinking coconut from each of his sister's sons. Occasionally someone outside these categories might send a basket containing a coconut in hopes of getting the land. When A1 received the baskets he and B1 together decided which of the potential heirs was best, and B1 announced publicly which heir had been selected. The normal order of inheritance was through the brothers in order of age, and afterwards through the sister's sons, also in order of age. If the chiefs wished, they might skip individuals closest in line, but only rarely was the order completely disregarded. The eldest brother, or whatever heir was appointed, took the widow and her children to live with him. He also divided the farmstead into its smaller parts and assigned them to the other brothers or sister's sons as he felt best. These shares of the farmstead could not be taken back by the appointed heir once they had been given. If a man died leaving no brothers and no sister's sons, the male clan members sent coconuts to the chiefs and an heir was selected from among them. A man's son could not inherit unless the clan was almost extinct, and a young man looked to his mother's brother (ŭlap) instead of his father for the land he would eventually inherit.

In other districts a father, before his death, divided (pwăisăis) his farmstead into approximately equal shares (pwăis) for each of his children which they later inherited. In Sokȩs District daughters could not share in the division and women did not own land, but in Kiti and Matălanim they could. The district chief (A1) had the theoretical right to alter the division of property, but very rarely exercised it. As each child approached marriageable age, the father gave him or her one of the parts into which each farmstead was divided by streams, trees, rocks, ridges, and other natural boundary markers. The children worked these pieces of land and the crops they produced were their own. If a man died without having divided his property his elder brother, who took the father's place in looking after the children but did not acquire any rights to their land, divided the property among the father's sons and daughters. The widow continued to live in her husband's house with her sons and their wives, and to work her share of land if her husband had kept a piece for her and himself. If she died or if she decided to return to her own family, this share and the house itself passed to the eldest son or was divided among the children. None of the land went to the father's sister's son.

In the native period, coconut and breadfruit trees, houses, breadfruit pits, and the right to the land were the most important properties involved in inheritance. A pit breadfruit was not divided among a man's heirs. Where inheritance was patrilineal all breadfruit pits were inherited by the eldest son who took charge of them for the other children. If he used part of one of them for subsistence he would send some to each of his siblings, but if he used one as a contribution to a feast he took all the praise and credit himself. Canoes, nets, domestic animals, and a few other more permanent movable objects were inherited, but much of the property was ephemeral and some of an individual's smaller favorite possessions were buried with him, his best skirt, his axe, his paddle, and in later times his pipe. Today money and, for a few individuals, boats, store inventories, commercial and industrial buildings, and some other items have been added, but for the majority of families the farmstead and its developments are still the major items in inheritance.

Under the Germans the native system of inheritance was modified according to terms printed on each German title to land. Patrilineal inheritance was made standard throughout the Eastern Carolines. The former native custom of dividing the land among a number of heirs was prohibited. For reasons that are not apparent the owner was forbidden to will the land to heirs of his own choosing, as had been done in all districts except Ŭ. The order of inheritance was specifically stated on each deed to be (1) the eldest living son, (2) the eldest living grandson, (3) the eldest living brother, (4) the eldest living son of the brother. It is, of course, understood that after the death of the eldest

son the property passes to the younger sons before passing to the eldest grandson, and so on for the other groups. The order of inheritance is clear in the German text on the deed, but the parallel Ponape translation which was made by a Mortlock man is difficult for the Ponapeans to understand. This regulation represented a marked departure from native custom in Ũ District, and in other parts of Ponape it meant that women could no longer inherit or own land. If the titleholder had none of these relatives he was advised to adopt an heir, a common practice on Ponape, and if he died without having done so, an heir would be selected by Chief A1 and the German district official. The provision that illegitimate children may inherit as real children, if the parents have subsequently married, is contained in the Ponape translation but not in the original German text.

This system was considerably modified by the Japanese. They made no attempt to prevent the division of land among a number of heirs, permitted women to inherit and own land, and disregarded the order of inheritance. Ponapeans say that the heirs were selected by the Japanese, each case being decided as a separate instance with no discernible pattern of inheritance except that of favoring individuals who spoke Japanese or were pro-Japanese. There is nothing to recommend a lawless system that lends itself to favoritism and graft and provides only uncertainty for both property owners and potential heirs. Nor is the German system acceptable in which different cultural traditions are forced into a single pattern to standardize procedures for administrative convenience.

The correct approach is one which has already been taken by Military Government. The district chiefs and representatives have been asked to codify their laws and then to attempt to standardize them for the island as a whole to the extent that they are willing to compromise and make concessions. It should be noted that the Ponapeans are aware of the disadvantages of having five sets of customary laws on an island 130 square miles in size and containing only 5,500 people, and they desire to arrive at islandwide laws so far as possible. The chiefs of Ũ were undecided whether they wished matrilineal or patrilineal inheritance, having had experience with both systems and seeing certain advantages and disadvantages in each. There is a real possibility that they will decide upon the patrilineal for the sake of uniformity and so that they may pass their lands to their own sons. This decision should be left to the people of Ũ and should not be decided by a majority vote in the interdistrict meeting.

Other questions to be settled are the order of succession, the right of a man to will his land to an heir of his own choosing, the right of women to inherit and hold land, and whether it shall be possible to divide a farmstead among several heirs. This last point is one in which Ponapean tradition is directly counter to their own economic interest, particularly since the farmsteads, with few exceptions, are small, and since there is adequate land for expansion. The inheritance of the farmstead as a whole, with new farmsteads established by landless heirs and some provision for them to share in the manufacture and proceeds from the copra until their own trees come into production, is far better economically than a situation where an individual owns a sixth of a farmstead in one section, a third of a farmstead in another, and perhaps a quarter or a half in another district.

It is situations like this which are the real test of the administrator. Does he take the easy paternalistic solution and make a law that is for the native's economic benefit? Does he give lip service to the principle of self-government by discussing the problem with the natives, but in such a way that they express what they think he wants rather than their own desires? Does he leave the decision entirely up to them, without influencing them in any way, with the result that the old tradition is continued to their own economic disadvantage?

There is no easy solution and no easy set of rules for resolving situations of this sort. It is not even easy to decide whether the economic disadvantages outweigh the advantages of allowing Ponapeans the right to determine their own future. To be able to leave the choice up to them so that they decide of their own free will, ironing out their differences of opinion by themselves, and still to offer the choice in such a way that the advantages of the new course are presented effectively enough to be accepted freely either now or later, requires leadership, diplomacy, and discretion. It also requires complete understanding of Ponapean attitudes and reactions and of the relationship of the chiefs to their people and to the official interpreter.

LEASE OR SALE

In the native period tenants had no right to sell, lease, or give away land, since the title to land rested with the district chiefs. The inheritance of the right to a farmstead by a tenant's heirs was subject to the approval of the district chiefs (A1 or in Wąnę B1), as was any arrangement made by the tenant with a stranger who wished to take part of his farmstead. Any such changes had to be reported to the district chief and the chief's approval represented a new contract between the chief and the new tenant, except that a few district chiefs were permitted to have tenants of their own.

Under the German system the sale, lease, and free gift of land was made subject to the district chief (A1) and the Governor. Until 1931 the Japanese prohibited the "purchase and sale, assignment or mortgage" of land owned by natives except to the Government. This included agreements to make land "the object of security." Leases and other contracts regarding land between natives, on the one hand, and Japanese or foreigners, on the other, were not valid unless registered and approved by government. In 1931 the system was changed to permit the "purchase and sale, assignment or mortgage" of land to private individuals subject to the sanction of the Director of the South Seas Bureau.

In making this change the Japanese authorities concluded "that if they exercised sufficient superintendence over such transactions there would be no evil results." A person desiring to purchase native land was required to enter an application giving his name, age, occupation, permanent address, the reason for the agreement, the full text of the agreement and particulars concerning the piece of land involved. The Chief of the Bureau was then required to report to the Director on the following points:

1) Whether the land, which is the object of the agreement, is owned by the native concerned, and whether the whereabouts, area, and boundaries of the land mentioned in the application are accurate.
2) Whether the agreement was entered into freely.

3) Whether the terms of the agreement are just and reasonable and contain nothing disadvantageous or unjust to the native concerned.

4) Whether the price named in the agreement is reasonable.

5) Whether the reasons necessitating the agreement which is mentioned in the application are true.

6) Whether, as a result of the agreement, the native concerned will experience difficulty in maiknng a living in the future.

7) The condition of the property and the income and expenditure of the native concerned.

8) An outline of the past career, character, behavior, and credit of the person concerned.

These provisions are quoted because questions of this type must have full investigation and correct answers if native land tenure is to be protected. Experience in colonial areas all over the world, as well as among American Indians in the United States, has shown the evil consequences of the alienation of native lands; loss of land can be used as an effective means of recruiting cheap wage labor and native populations who do not have the alternative of producing their own food on their own land have no freedom of contract. Experience has also shown that the evil consequences of permitting free sale of lands far outweigh the benefits of self-determination. With reference to the protection of native rights to land the argument of paternalism can be ignored as feeble and insipid.

For adequate protection of native land, leases must also be subjected to strict supervision. On Ponape the more fertile land could quite as effectively be alienated through long-term leases, and on the atolls entire populations could in effect be made landless for a lifetime through the same device. Such results have not been unknown in the Pacific where large foreign-owned plantations have been established. The Japanese imposed the same restrictions and regulations on leases that they did on the sale of native land, with the exception that the Chief of the Bureau was required to report to the Director beforehand if the land concerned exceeded 2 chobu (1.98 hectares) or if the term of the agreement exceeded twenty years.

There is no record of alienations of native land in the German period following the granting of private titles. Under the Japanese, sales were impossible except to the government until 1931, and by that date the amount of government-held land was relatively small. After that date the large Kohatsu plantation in Matālanim and the Nambo plantation absorbed increasing amounts of both unoccupied and native-owned land. Other native lands were leased or sold to Japanese individuals. Additional tracts of native lands were purchased by the government, including land for the main airfield in Sokȫs District, parts of Nȩt District for the expansion of the Colony, and Lȩngȩr and Parȩm islands in the Colony harbor and the central part of Tȩmwȩn Island in Matālanim harbor for Navy installations. The Ponapeans could not refuse to sell and afterwards they had to rent land from the government or live with friends. It is understood that payment was made in all cases but this point should be confirmed.

As American policy, full reports should be required on every lease and sale, including a statement as to the total amounts of land already held on the island through leases or ownership by the contracting parties; decisions of the responsible authority should be subject to review by a special board; and leases should be restricted to relatively short periods of time. These principles should govern leases and sale of land between natives, between natives and foreigners, and between natives and government, as well as leases and sale of unoccupied government and district lands. Although no individuals are dispossessed by the transfer of unoccupied lands, such transfers affect the possibility of the future growth of the population and of the settlement on Ponape of people from other islands; they are also sometimes directly related to the problem of wage labor, whether locally recruited or contracted from other islands. Government land requirements should be kept to a minimum, and former Japanese lands that are not needed should be returned to native ownership. Only where a landless native now resident on Ponape wishes to establish a new farmstead on occupied district land should these reports and restrictions be waived.

On Ponape no private native lands should be acquired by natives, nonnatives, or government without providing the seller or lessor opportunity to acquire full title to an equivalent amount of equally good unoccupied land. The terms of the contract should provide adequate remuneration for the improvements made on native lands including buildings, paths, boundary markers, coconut and breadfruit trees, other crops, and the like, as well as for the inconvenience of having to move and live elsewhere, perhaps in a more remote area with less fertile land.

Regardless of the questions that are asked and the forms that are to be filled out, there is always a danger, if alienation of land is in any way permitted, that native land tenure may not be protected. The pressure of other duties, personal relationships to the parties concerned, lack of interest in native welfare, laxity in the performance of duty, the attitude or the ability of the government interpreter, or other factors may mean that the local official's report is not accurate or that the decision of the responsible authority is unjust. The only certain method of protecting native rights to land is the complete prohibition of all sales, transfers, and leases. If any policy short of this is adopted, administrators must be impressed with the fact that their primary obligation is to prevent the alienation of land and that leases and sales should be approved only when there appears to be no possibility of unfortunate consequences to the individual who is parting with his land or, where unoccupied lands are concerned, to the island as a whole.

For movable property a variety of forms of transfer are recognized, some of which cannot be equated with American concepts. None of these is dependent upon money, which was unknown on Ponape until the period of contact. Ponapeans are familiar with the shell and stone money of other islands of Micronesia, but they say that nothing similar was in use on Ponape in the native period. Recognized forms of transfer are listed below (a-h).

a. Pwāin (buying), or nȩt as it was known before contact, covers purchases, sales, barter, and payment for services. Transactions which are called pwāin are characterized by (1) an obligation on the part of an individual who received goods or services to return money, goods, or services in exchange, and (2) by a definite relationship in value or price of the goods, articles, or services exchanged. In the days before contact, pwāin or nȩt was carried on entirely without money. It was a form of exchange of minor importance although certain "traders" (sȫunȩt) procured fish nets,

pigs, sennit, and other items for customers in this way. Today it is still of minor importance in the Ponapean subsistence economy, but it covers all the sales of copra, handicraft, and other items for export, as well as the purchase of all imported goods from the stores.

b. Kisākis is close to the English "gift" in meaning. The obligation to repay a gift at some future date is recognized, but the relation of kisākis to other forms of exchange must be understood in the light of the Ponapean's feeling that such a gift does not carry the obligation for any immediate return and that the goods returned need have no relation in price or value to the goods received. "Gifts" are very important in the economy of Ponape and are used in situations which occur frequently.

c. Ɨsāis or Ɨsą is a form of repayment or gift in return for a favor, a kindness, or a service. This category covers property transfers occurring in a wide variety of circumstances, each of which can be distinguished by a specific term. It covers rewards for the services of all the experts or specialists; there are Ɨsąn wini (medicine) for the native doctors (sǫu wini, kathin wini), Ɨsąn inting (tatooing) for the tatooers (kathinting), Ɨsąn ta ūk (seine) for the seine maker (sǫu ūk), and many others. In addition there are Ɨsąn wār (canoe) in return for a canoe ride, Ɨsąn māir (sleeping) for staying overnight in someone's house, Ɨsąn Ɨmw (house) for the use of a house and its furniture for a number of days, Ɨsąn lǫkaia (talking) for services as informant or interpreter, and many others. For any unspecified kind of work there is Ɨsąn tǫtǫk (work), and all the various forms can be included under the general term Ɨsāis. The first fruits given to chiefs are regarded as Ɨsāis in return for the use of the land, and in recent times taxes have been added to this category.

In Ɨsāis an obligation to give something immediately in return for services is recognized, but no relationship between the value of the goods given and the services received is involved. In the former respect it resembles pwāin and differs from kisākis; in the latter it is like kisākis but unlike pwāin. It is important for Americans on Ponape to recognize this distinction if they are to avoid giving unintentional offense to Ponapeans. It frequently happens that when an American gives something to a Ponapean in return for his services or his hospitality, the latter protests that the former is trying to pay for or buy (pwāin) something that has been given out of friendliness, hospitality, or good will. It is apparent to the Ponapean when Americans calculate what would be a fair payment for the length of time they have stayed at his house or employed his services. He is embarrassed for fear that other Ponapeans may think he is selling his hospitality or services under conditions where etiquette calls for them to be offered without thought of reward or, more specifically, without thought of the value of the goods received.

In part these protests may simply be good form, since Ponapeans can usually be prevailed upon to accept the gifts. Usually a considerable amount of time is required to convince them that the goods also are offered freely and in friendship, that the giver feels under no obligation to give as much as he has done, and that the relationship between their value and the services received is purely accidental. Since as a matter of principle full payment for services should always be made regardless of Ponapean custom, it is worth knowing that such situations, which may be embarrassing to both parties, can be avoided by not giving gifts at the end of a stay or when services are terminated. The Germans employed the method of repaying hospitality by gifts sent at a later date. This might well be coupled with an initial gift given casually upon arrival or soon after an individual's services have been engaged.

Similarly it is not good form to repay "gifts" immediately. Americans who receive a basket or a grass skirt and immediately reach into their pockets for money or cigarettes may unintentionally insult a Ponapean by reducing his "gift" (kisākis) to a sale (pwāin). A proper length of time should intervene before a "gift" is repaid, and preferably repayment should be made when the social situations of the donor and the recipient have been reversed. It should be recognized, however, that some natives use the "gift" as a device to sell (pwāin) souvenirs to American visitors and expect immediate repayment; in such situations it may be difficult to determine the intention of the native, and the best procedure is probably to ask if the transaction is truly kisākis and take him at his word.

The differences between these three forms of exchange, which may be difficult for Americans to grasp, lies basically in the fact that neither Ɨsāis nor kisākis are regarded as payment. It is only in pwāin that the true value of goods or services enters into the transaction. Ɨsāis and kisākis differ from pwāin in that there is no relationship between the value of the goods given and the value of the services received. On the other hand Ɨsa'ls and pwāin differ from kisākis in that there is an admitted obligation to give something at the time. That these differences have not always been understood by Military Government is shown in the establishment of price ceilings on the services of seamstresses for making dresses, chemises, and other articles of clothing; in so doing Military Government unknowingly changed the transaction from Ɨsāis to pwāin by establishing for the first time a definite relationship in value between the services and the goods.

d. Sąwą is limited to the exchange of food for fish which have been caught with a new seine. This is not barter or pwāin since again there is no value relationship between the goods exchanged; it differs from Ɨsāis in that goods are exchanged for goods rather than for services, and it differs from kisākis in that the exchange takes place almost simultaneously. When a fishing group goes out with a new seine the first four days that it is used, all those who wish to share in the catch assemble at the Section feasthouse and await the return of the fisherman. They bring with them baskets of breadfruit, yams, pit breadfruit, drinking coconuts, sugar cane, kava plants, sprouted coconuts, bananas, and other foods to sąwą for fish.

When the fishermen return, the entire catch is divided into equal shares. A share is given first to each of the district chiefs who are present and second to the section chief, as first fruits. Shares are then given to the people who have come to sąwą, and finally to the members of the fishing crew. Each person who has come to sąwą receives the same amount, regardless of how much food he has brought. A man who brings one yam receives as much fish as a man who has brought five yams, but he may be gossiped about whereas the man who gives the most is praised. All the food that is brought is divided among the fishing

crew, with the chief fisherman (sǫ̃useṯh) receiving the largest share.

An occasion was described on which a large number of people came with lots of food to await the return of the fishermen. Chief A1 and the section chief were present. When the canoe landed, the head fisherman got out of the canoe and walked up the beach carrying his canoe pole, which he brought into the feast house and laid before the chiefs. Everyone laughed. This is the symbolic act by which fishermen always announce that they have caught nothing and that there are no fish to share. Those who came to sa̧wa̧ went home empty handed, laughing at the fishermen and joking about them for having broken the sexual taboo. But the fishermen kept all the food that had been brought to the feast house, dividing it among themselves.

e. Ka̧ting is similar to sa̧wa̧ except that it occurs when schools of spawning fish are caught with a seine, rather than when a new seine is first used. The food and the fish are divided in the same manner. Both ka̧ting and sa̧wa̧ are still practiced today in the outlying districts, but rarely in the Colony.

f. Pwãisãis is another form of sharing or dividing into shares (pwãis). It covers the sharing of a meal to which both husband and wife have contributed, the sharing of food with guests, the dividing of a fishing catch among the fishing crew, and dividing an inheritance among a man's heirs.

g. Nę is another form of sharing, pertaining to the dividing of food at a feast among the guests, each of whom takes his own share home.

h. Other forms. There are also said to be separate terms and concepts for the contribution of food to section feasts, for presents given at funerals, and there are probably still others that were not recorded.

All these types of exchange involve a transfer of title or at least a relinquishment of title on the part of the former owner. They are thus distinguished from mwĩtǫng, which are loans or leases and in which the borrowed object must be returned. The borrower is responsible for returning the property in good condition and he is also obligated to give an ĩsãis to the owner in return for its use. If for example a woman borrows another woman's hand net, and it is torn or the handle is broken while she is using it she must repair it before returning it. If she does not do so, or if she fails to give the owner a part of the catch as ĩsãis, she will not be taken before the chiefs, but the owner will not let her use the net again.

Responsibility for damage done by private property is fixed by Ponapean tradition on the user of the property and not on the owner. If a canoe drifts from anchorage damaging another canoe, the damage must be repaired by the individual who failed to fasten it properly regardless of who owns it. If a man is taking care of someone else's pig or cow and the animal causes damage, he and not the owner must pay for it. Such cases are common, and in the Japanese period the individual responsible for the animal had to pay 1 yen for each yam vine that was destroyed; there were no established prices for other crops.

GIFT-EXCHANGE AND HOSPITALITY PATTERN

Gift giving and hospitality are especially characteristic of Ponape. When traveling about the island a Ponapean stays with a clan member whom he knows well or with a close friend. If he must stay in a section for the first time, he introduces himself to anyone he meets, giving his name and clan, and is directed to the house of the nearest clan member, who is responsible for providing him food and shelter; the district and section in which he lives are not mentioned until it is time for leave-taking.

On the day following the arrival of a visitor all the adult members of his clan living in that section come to welcome him and introduce themselves. Each brings with him a gift: a bottle of perfumed oil, a shirt, trousers or a dress, a piece of cloth, a sponge, a hat, a mat, or money; or the gift may be some food to help the host entertain his guest. In the old days gifts were not always brought, but each clan member annointed the visitor's hair with perfumed oil; today this tradition is maintained only in that the gift to the visitor may be a bottle of perfumed oil. In addition the clan members may bring bananas, a yam, a pineapple, a pig, a chicken, or some other gift for the visitor to take with him when he departs. The visitor does not ordinarily give gifts in return or ĩsãis to his host unless he is staying with unrelated strangers, the theory being that the hospitality of the host and the gifts of clansmen will be returned when they visit his section.

Gifts are also received from nearby clansmen when an individual is married, during a woman's pregnancy, when she bears a child, and when an individual leaves on a trip or returns from one, or when a husband or wife dies. These gifts are freely given and in theory neither are they given in repayment of gifts previously received nor do they imply an obligation of repayment at a future date. In practice they are repaid when the social circumstances are reversed, as for example when the donor travels, is married, or when his wife becomes pregnant, bears a child, or dies. An obligation to present gifts to clansmen on such occasions is recognized.

The same can be said in theory of the "feasts" (kamatipw) that are given for visitors. Although theoretically feasts, like gifts, are freely given as a gesture of friendship, a host is under a social obligation to give a feast for his guest that he cannot disregard. Ponapeans feel it is very bad if an individual entertains a visitor without making a feast for him, and feasts are often made for a friend or a person of importance who is staying nearby with someone else. Yams, breadfruit, and other food are contributed by neighbors and relatives, but the host must provide at least one pig and some kava and must later repay the contributions of his neighbors. The distribution of food to take home is characteristic of Ponapean feasts. Frequently less is consumed at the feast than is given away to be taken home. Although some food is generally eaten at a feast, the main elements are the drinking of kava and the distribution of food.

A feast places on the guest a definite obligation to give a return feast for the host when the host comes to visit him, regardless of the theory. The second feast cannot be smaller than the first and generally involves twice as many yams and pigs, or more. To give less than this, and particularly to give less than was given in the first feast, is very shameful. At the end of the second feast all obligations are wiped out. Informants have heard that on Kusaie a second feast must be followed by a third, a third by a fourth, and so on, with each feast as large or larger than the one

preceding. On Ponape, however, a third feast counts only as the first feast in a new round, and the amount given is left up to the host without reference to what has previously occurred.

Some individuals have exploited feasting as a racket for accumulating property. Whenever someone who owns a number of pigs is in their neighborhood he is invited to their house for a feast. After the feast has been given, they make it a point of showing up in the section where the guest resides, sometimes allowing him just sufficient time to get home, knowing that he is obliged to give them a return feast with more yams and more pigs than they gave. The Ponapeans say these are "bad" people who "go after their kamatipw" and "feast to get pigs." When the host is about to kill a pig at a feast, his guest has the right to say "Oh, don't kill that pig. That is mine." Or "Don't cook that yam, I will take it home with me." This is not regarded as bad form. Actually it is said to be better form to ask for pigs and yams, than to have them eaten at the feast, though it is best to allow the kava to be drunk.

In this way unscrupulous individuals can get yams for future feasts or for use at home and can accumulate large numbers of pigs. Even if the others ask to take pigs and yams home, they must always give more and better ones when their former host turns up for the second feast. There is no decent way in which an invitation to a feast can be refused. Some Ponapeans are afraid to call on a more wealthy individual for fear of being invited to a feast, and if they are called in to rest for a moment while passing his house, they try to get out of it by saying they are just going to the next farmstead and try to get away as quickly as possible. Some have taken to sleeping on the road when traveling, on the ground under a tree, unless it is raining when they seek whatever shelter they can find without being seen. Feasting is one of the most widely discussed issues among the common people. It has not been brought up at the meetings of the district chiefs nor is it likely to be, since some of the most notorious offenders are chiefs. Some informants, whether in moments of cynicism or realism, say that most Ponapeans today are "bad," and one of the worst offenders is a nondrinking, nonsmoking Christian who attends church faithfully.

Gossip is powerless as a means of social control of this practice. The bad people are said to care more for the pigs they accumulate than for what is said about them or whether they are laughed at and criticized. They may feel shame, but they get the pigs. In this they are perhaps comparable to individuals in our society who "observe the letter of the law" or "operate within the law." The same individuals commonly bring small amounts of food to sąwą for fish and attend feasts given by others without contributing to them. They are not afraid to give a return feast that is smaller than the one originally given for them so that inviting them first offers little protection to those who disapprove of their methods. A bad person does not "run after" another bad person to give him feasts, but after those who "try to make their name good among the people" by giving more than they receive; and there are some who are ashamed if they receive more in the second feast than they have given in the first. It would seem that the force of gossip as a means of social control has been weakened through contact. Certainly it is difficult to imagine that the present circumstances have continued for a long period of time. It is an interesting situation where the need for social change is recognized but the mechanism for accomplishing it has not yet been discovered. As a Ponapean stated the rather hopeless position of his people, "We do not like feasting on Ponape, but it is our custom."

The largest feast remembered by informants was given when the statue was erected in memory of Henry Nānipēi. The circumstances were not typical, and people from all over the island, the government, and the traders contributed. Ten cows and many, many pigs were killed, and one thousand large yams were distributed, each district having brought two hundred. Most of this was taken home uncooked since the guests brought their own cooked food for the feast with them.

Feasts are given by a family at marriages, during pregnancy, at the birth of a child, after someone has been buried, when a man receives a new title, when a new house is built, when a new seine is completed, and when leaving on or returning from a journey. Since the German period some families have given birthday feasts, and since the Japanese period some have commemorated the death of a father, mother, or child with an annual feast. There is no objection to this type of feast, which does not involve a return feast for the host with the exception of the feast for a new title, one that has also been abused in some districts. An individual is given a title, and when his pigs have been used up in feasting, the title is taken away and given to someone else who has pigs. In the olden times a chief kept his title for life or was promoted to a higher one. In one case, in Matālanim District, a new title, named after a character in a legend was created for use in this manner.

Feasting, hospitality, and gift-giving leave Ponapeans unprotected against exploitation both by members of their own group and by foreigners. All three are readily extended to nonnatives, and in such cases the obligations of the host are even greater. In line with their policy of trying to limit feasting the Germans tried to avoid obligating natives to make feasts for them, and never attended feasts unless they were invited. When they traveled about the island they always stayed with the same individuals (Henry Nānipēi in Kiti proper, Chief B1 of Kiti in Wąnę, Chief A1 in Matālanim, and the former Chief A1 in Ū District). After returning to the Colony they always repaid the hospitality given them by sending biscuits, beef, rice, tobacco, and other imported commodities as gifts.

Under the Japanese, feasting revived again and was soon even more frequent than before. At first the Japanese notified the district chiefs that the German regulations concerning feasts would be continued. Not long afterward they returned with the news that the Governor was coming on an inspection trip and that the district should make a feast in his honor and should bring chickens, yams, bananas, and other things for him to take home. Next it might be the Secretary, a high official from Palau, a policeman, a Navy officer, or a schoolteacher. An endless stream of major and minor officials visited the outlying districts and were feasted and presented with gifts. At a feast for a Japanese working on the road to Kiti, ten pigs and one hundred large and small yams were used. Some Japanese also made a point of attending every feast they heard about whether they had been invited or not, each time carrying away pigs and yams. Soon the district chiefs were visiting the sections regularly, and feasts for chiefs were again in full swing. They have continued through the early postwar period.

American visitors have felt pleased and flattered

when their host or a chief makes a feast for them or ladens them with parting gifts. They mistake an obligation that for a Ponapean must be fulfilled for a personal compliment. Instead of giving them satisfaction, gifts and feasts should make Americans feel uncomfortable because of the economic burden that they impose. On one occasion before I realized the significance of this, I was presented with yams, breadfruit, crabs, eight pineapples, six chickens, and twenty stalks of bananas on leaving for the Colony, most of which had been brought by school children at the direction of their teacher. Even according to the current Military Government prices this represented about three weeks' wages. Ponapean informants have told how they have had to make excuses to families who were going to kill their only pig to make a feast for them; the obligation when the visitor is an American is even greater.

It should be made a matter of official policy and responsibility to see that all the costs of entertaining Americans and that all gifts, personal or otherwise, are repaid in full. Americans leaving Ponape, particularly high officials, are often given skirts, canoe models, dance paddles, baskets, belts, cigarette cases, and tortoise-shell combs and wristbands that total a great deal of wealth by native standards either in labor or in cash value. Seldom do the givers receive gifts of equal value in return. It would not be particularly desirable and it would certainly be difficult to prevent all Americans who go out "to see native life" from accepting gifts or staying when the family they stop to talk to suggests making a feast for them. But this must be done or some provision for repayment of gifts and hospitality must be made if there is not to be a drain on the Ponapean economy which, objectively, can only be regarded as tribute to the American rulers.

Suggestions have already been made concerning the manner in which this might be done without reducing gifts and hospitality to pwäin. Two or three rest houses in the outlying districts would reduce the necessity of imposing on natives when traveling. Carlos Etscheit, who has had ample opportunity to see the economic effects of hospitality, feasting, and gift-giving, always travels with his own cook, stays only with Ponapeans with whom he has an understanding that he will provide his own food, and manages to avoid feasts. In the Ponapean pattern repayment is through reciprocal hospitality, feasts, and gifts at a later date. Most of the Ponapeans who offer these to Americans will visit the Colony at some time or other, but it is unlikely that their hospitality will be repaid either in the mess or in private homes. A solution that might be acceptable within the pattern would be to provide a guest house they could use and to make a return feast for them there. Another that perhaps would prove acceptable would be to provide food for all who stay in the district houses in the Colony. It would be difficult to discriminate among the people who stay in district houses, but hospitality in the district might be arranged so that its burden was more widely distributed and did not fall heavily on any individual. The German practice, or some modification of it, has the advantage of repaying in imported goods, which must be purchased, rather than in food, which can be produced locally. So long as it is acceptable to the Ponapeans, the method of repayment and the question of whether the cost is born by the individuals or by government are less important than its enforcement. Anyone who questions the cost, to either the American individuals or the American government, should stop and reflect upon the cost to the Ponapeans in terms of their incomes.

TRIBUTE OR TAXATION

Several forms of tribute or taxes were paid to the chiefs in the Native period. A chief could call on any members of his section or district for contributions to feasts; the top district chiefs were provided with special houses and canoes; first fruits were given to them; and in addition a series of feasts were given for the district chiefs throughout the year. Through these the chiefs, and in particular the top district chiefs were supported as a true leisure class.

The feasts given for the district chiefs fall into two main categories, kamatipw, similar to those described in the previous section, and nõpwẽi which are regarded as a form of tribute or "working for the chiefs." Eighteen separate nõpwẽi, occurring at different times of year, were listed. In addition there were two kamatipw and, in classes by themselves, lïli and a feast called "Hurry" (kạiäk). All twenty-two of these had to be given for the district every year by each section. Until a section made lïli for the district chiefs they could not eat it themselves. The same was true of ïthïth (see chapter 4), which is one of the nõpwẽi feasts. Although they are not all classed as nõpwẽi, there seems to be no objective basis for regarding any of these feasts as different from tribute. All were regarded as tribute by the Germans.

The two kamatipw required for the district chiefs are known as ïra ïsọl and takatak tipanïth. The first marked the beginning of the period (ïra) of the yam harvest (ïsọl); it took place after all sections had given yams to the district chiefs as first fruits. The meaning of the second is not clear; it took place toward the end of the yam season and when yams were becoming scarce. Between these two came a number of other kamatipw given within the sections; the names of these were not recorded. This is the season when prestige competition is at its height.

Some of the feasts for district chiefs were very large. At one in Kiti twenty large pigs, twenty very large yams, each requiring eight or twelve men to carry them, five large pit breadfruits, and one hundred kava plants were used. The entire feast house was filled with twelve stone ovens, and when the hot stones from them were spread the floor was solid with red-hot stones.

There are several kinds of "first fruits," or what Ponapeans more accurately refer to as "first things" (mwọ̃n kọpwa). There are the "first yams" (kọta kãp), "first breadfruit" (mwọ̃n mäi), the first catch with a new seine (pas ük), and other smaller "first edible things" (mwọ̃n tipwisọu). All these are regarded as kinds of nõpwẽi, and also as ïsäis or reward to the chiefs for the use of the land and the lagoon. They may be referred to as ïsạ̃n mwọ̃n kọpwa, ïsạ̃n kọta kãp, ïsạ̃n mwọ̃n mäi, ïsạ̃n pas ük, and ïsạ̃n mwọ̃n tipwisọu.

Each tenant or landholder was obligated to present first breadfruit and first yams to the chiefs each year before he and his household could eat them. The responsibility rested only on the head of the household as tenant, and not on each individual or each adult male. First fruits from each farmstead were presented to the section chief. When the section chief had in turn presented first fruits to the district chief who owned

the land, the people in the section were free to eat yams or breadfruit until the following season. If one or more district chiefs resided within the section, first fruits were also presented to them, and they likewise presented first fruits to the chief who owned the land.

Each tenant gave whatever number of yams or breadfruit he wished to the section chief and the district chiefs within the section. The section chiefs, however, could not bring less than five breadfruit or five small yams to the owner of the land. In Kiti District the numbers were always five or eight or twelve, whereas in Matälanim they were either five or eleven; these numbers are related in a way to the manner in which breadfruit or similarly shaped objects are piled in the men's basket (kïam), four on the bottom and one on top in the center; six on the bottom and two on top; or eight on the bottom and three on top. Which of these amounts were taken was left up to the donor, and if a very large yam were given one would be sufficient.

Similarly the choice of the variety of breadfruit and yams was left up to the donor, any variety removing the prohibition on eating all. Usually however, early varieties were selected so that the family could begin eating yams or breadfruit at the beginning of the season. It is believed that the variety of yam given as first fruits will, except for certain very late varieties with a fixed season, be the first to mature the following year. As a result, good varieties were usually offered. A poor person who had no breadfruit trees might go to the mountains and pick some growing wild or he might offer a soursop or a fish or any other food, announcing to the chief "This is my breadfruit, because I have none." This pleased the chiefs because it was regarded as an indication of true loyalty.

It was customary for the section or district chief, upon receiving first fruits, to share them with the donor and with anyone else who was present. If the others did not wish to eat any at the time, they would be offered some to take home with them. The first fruits that remained could be disposed of by the chief at his own discretion. He used them for his own needs; he might give some to other chiefs or to neighbors, and if he were a section chief he might save some to take to the district chief.

Whenever a new seine was first used some of the catch of the first four days was presented to the section chief and resident district chiefs as "first fruits" when other people gathered to sąwą. If the district chief who owned the land were present, he would receive the first share, otherwise some would be sent to him by the section chief. Again five was the minimum number acceptable to the district chief, and if the catch were large more might be offered, following the pattern of traditional numbers.

Many other things were also given as first fruits, including some of the first fish caught in a weir, in a new fish trap, or with a new canoe, and the first piece from a pit breadfruit. If crops of taro, Cyrtosperma, or pumpkin were planted, they would be presented in addition to yams, and "Western yams" and chestnuts, which grow wild, were gathered and included if the family wished to eat them. Mangoes like breadfruit were taken every year during the summer whether new plantings had been made or not. New plantings of bananas, pineapples, and kava could not be used until some had been presented to the chiefs, but if these crops were not planted the following year, those left from the year before could be used without giving first fruits again. If a visitor asked for some bananas or mangoes or breadfruit growing on the farmstead from which first fruits had not yet been presented to the district chief, the owner asked to be excused from giving any and explained the reason.

No animals or domestic fowls were used as first fruits, nor was part of the first catch with a new pig trap or chicken trap presented to the chiefs. In the case of wild birds caught with birdlime, only pigeons had to be presented each year before they could be eaten. Coconuts, which are regarded more as a drink than as a food, might be sent along with other first fruits, but were not required. Pandanus, papaya, citrus, cassava, and sweet potatoes were not given, nor were any of the more recently introduced foods.

Besides being able to call upon his subjects for yams or pigs or other food whenever he needed them, a district chief often entrusted them with pigs or yams that he had received to raise or plant for him, and these were specifically recognized as being the property of the chief. Whenever the chief required his house repaired or other work done, he could call on his people to do it, in return for which he provided them with food. Most of the chief's needs in the way of clothing were taken care of by his wives who made skirts and belts for him to pass the time while their servants performed the other household duties, but these items were also presented to the chiefs as gifts by the people and garlands of flowers were frequently given.

In the German period, it became necessary for the first time, for the chiefs to work and make their own farms. At about the same time that the land was distributed among the people, a head tax was substituted for the Ponapean forms of tribute and the chiefs were put on a salary. The Ponapeans were told that the head tax would be substituted for all other forms of work for the chief, except one feast each year. In the land titles issued to the people, Article 7 provides that the sections will be required to give a "Feast of Honor" or kamatipw ęn wău (Ehren-kamatip) each year to which they will contribute a load of yams (the Ponapean translation specifies a "two-man yam," kăp kąi) for A1 and whatever they need for their own food and drink. The lesser chiefs who share in the feast are each required to provide a pig from their own possessions. All other feasts are left up to the wishes of the individual.

Although the nŏpwĕi and the first fruits are not mentioned in the title they were covered by this or other regulations. Some people did not give lïli, kąiăk, ïra ïsǫl, takatak tipanïth, or any of the nŏpwĕi, but gave only the Feast of Honor. Others of their free will continued with many of the old ceremonies. Similarly some stopped giving first fruits whereas others continued.

The head tax set by the Germans was 7 marks a year or 15 days of public work in lieu thereof. Informants say that the salaries paid to the district chiefs varied; at first A1 of Kiti received 1000 marks a year but later on this was reduced to 10 marks a month. B1 who had owned half the district received nothing. The land titles also provide that A1 may call the people twice a year for one day each time to work for him, in return for which he will feed them. The amount of work that could be done for the private benefit of the district chiefs was thus limited. The land titles also stated that with the approval of the district officer

the chief may call his people to work without pay on public works for the district, such as the feast house, roads, wharves, and channels.

The Japanese continued the head tax under the name of a poll tax, graduated the rates according to income, and made it applicable to males over sixteen years of age. At first the maximum was set at 20 yen a year, but this was later raised to 40 yen a year, with assessments over 10 yen requiring the approval of the Governor. The minimum was 3.60 yen per year, though individuals with physical disabilities or with five or more children, were exempted. At least in the earlier period the German custom of permitting the payment of taxes in copra rather than money was continued. Excluding the islands in the Marshall chain, 2,417 natives in the Bureau paid taxes in cash in 1937 totaling 10,999 yen; 771 individuals paid 3.60 yen each (2,776 yen); 1,328 paid 6 yen (7,968 yen), 11 paid 10 yen (110 yen), 3 paid 15 yen (45 yen); 3 paid 20 yen (60 yen); and 1 paid 40 yen (40 yen). After 1921 the chiefs were put on a regular salary instead of being given half the taxes collected within their district.

According to informants the Japanese imposed an additional land tax of 12 yen per year on each farmstead, though this is not shown in the official reports. Both forms of taxes are regarded by Ponapeans as a form of ĭsăis, like the first fruits to the chiefs; they are known as the ĭsąn mǫng (head) and ĭsąn săp (land). Payment for licenses is also sometimes referred to as ĭsąn lăisins by those who regard it as a tax but more commonly it is called "buying a license" (pwăinąn lăisins).

As has been indicated, feasting began again under the Japanese. The Ponapeans found themselves saddled with both taxes and the traditional methods of supporting the chiefs. In addition to the Feast of Honor the chiefs today are given first fruits, ĭlĭli ceremonies, and some of the nŏpwĕi in many of the sections. Although the chiefs cannot command a feast to be given for them, the people are obligated to give one when they come to visit a section. Some chiefs make this a regular practice. The sections have been giving feasts and first fruits under the Americans because they have not known where they stood. The German policy, both with regard to private ownership of land and to the restrictions of feasts and first fruits, is widely approved. The situation that existed under the Japanese, and which continued after the war, has caused dissatisfaction. First fruits, feasts, and other forms of tribute, and the problem of hereditary chieftainship are all related.

It should be emphasized that not all feasts are disapproved. The feasts causing dissatisfaction are the ones required for the district chiefs (ĭlĭli, kąiăk, ĭra ĭsǫl, takatak tipanĭth, the many different nŏpwĕi, and their modern substitute, kamatipw ęn wău), the feasts required for visitors, and the feasts made necessary by the abuse of the granting of district titles. There are no objections to the family kamatipw that are given at marriage, birth, death, and on similar occasions, or to the series of small voluntary kamatipw that fall during the yam harvest (formerly between ĭra isǫl and takatak tipanĭth), and nothing would be gained by prohibiting them.

In view of the feeling about first fruits and the various forms of feasting, the German regulations should be enforced. A favorable moment for doing this would be at the time that money taxes are again imposed, if this is not too far in the future. It would be preferable if the decision to enforce the regulations were taken first by the representatives of the Ponapeans, even though these appear to constitute a privileged minority. It is just possible, and well worth the attempt, that action might be taken if the question of feasting were raised diplomatically at a public meeting with the district chiefs and if the chiefs were given a month or two to consult with their people on it so that word of what was discussed might spread (with the help of some publicity).

After the war the Ponapeans decided to substitute work on the roads and other public work for taxes because of their financial situation. Able-bodied males between the ages of seventeen and fifty-five give three days labor each month without pay to the district or to Military Government, or they pay a fine or fee of fifty cents for each day missed, except for Military Government employees who pay forty cents. This amounts to thirty-six days a year, which is far higher than the fifteen days a year given under the Germans or the nine days (or less) under the Japanese. As the copra industry is re-established this requirement must be reduced and the money tax that is finally established must be low enough to be in line with native incomes. All labor of this sort directed by Military Government should be used only on projects for native benefit, and not, for example, in maintaining those roads in the Colony that should be the responsibility of Military Government. The monthly salaries established in April 1946 for district officials were $10 for the Nănmăriki (A1), $9 for the Nănikęn (B1), $8 for the district secretary, $7 for the chief of police, $6 for policemen, and $5 for schoolteachers.

7. LABOR

WAGE LABOR

Native laborers were employed as contract laborers, casual laborers, tenant farmers, and sometimes on a piecework basis. Ponapeans and out-islanders worked as field hands on the plantations and farms, as dock hands, in the trading companies, as domestic servants, and in a few government jobs.

Japanese reports for the Bureau in 1937 list thirty-seven native government employees, in addition to six civil engineers and three in "water, gas and electricity." Informants accounted for only fifteen who found regular employment with the government. About thirteen Ponapeans were regularly employed as policemen, of whom about seven were stationed in the Colony, one each in the districts of Nęt, Ü, Matălanim, and Kiti, and two in Sokǫs District (one in Palikir and one in Sokǫs proper). Two Ponapeans held menial positions in the post office, sweeping up and acting as night watchmen. In addition about twenty schoolboys were employed at the experimental station, but these positions were represented as training rather than regular employment. Some Mortlock men and other out-islanders worked on the government-paid road gangs. No Ponapeans are said to have been so employed, and most road laborers were from Saipan, Okinawa, and Korea (Sŏsęn).

The number of domestic servants before 1937 was estimated by informants between thirty and seventy; they worked on a contract basis and were used primarily as cooks and to gather firewood. About twenty natives were employed on a contract basis in Japanese stores and trading companies, and crews of about two hundred casual laborers worked for two or three days at a time unloading and reloading ships while they were in harbor. The crews of dock hands included Ponapeans, Mortlocks, Ngatiks, and other out-islanders living near the Colony. Japanese reports do not list the dock hands, but show nine domestic servants, nine engaged in commerce, and three receptionists in the Bureau in 1937.

The largest number of natives found employment on plantations as contract and casual laborers and as tenant farmers. The Kohatsu Plantation in Matălanim is said to have employed as many as one thousand laborers on a contract basis, of whom about two hundred were Ponapeans, one hundred out-islanders, and the rest Japanese and Okinawans. Nambo employed about twenty Ponapean men on a casual basis and, after 1937, fifty Ponapean women as casual laborers to cut copra on their copra plantation in Ponlangas in Matălanim District, in addition to between sixty and seventy men recruited from the Mortlocks and Saipan as contract laborers. It is understood that they were planning to replace all native labor with Saipan families employed as tenant farmers. On their copra plantation on Pakin Island another ten couples (about three couples were Ponapean) cut copra on a piecework basis, and the cleaning was done by other natives hired on short-term contracts. An unknown but large number of natives were employed as contract and casual laborers in Palikir after 1937, primarily in the production of paper pulp, cassava, and vegetables. About ten contract laborers were employed on the Etscheit Plantation near the Colony. The Nănipĕi Company employed some one hundred to two hundred native laborers, of whom a number were tenant farmers recruited by company ships from the Mortlock Islands, and others were casual and contract laborers employed locally. Japanese reports list 2,761 men and 694 women in the occupation of agriculture in the Bureau in 1937, but this figure does not differentiate between wage laborers and those engaging in agriculture on their own plantations. Other occupations listed for the Bureau in 1937 include seventy-four in forestry, three in chemical industries, one in other industries, one in stock raising, nine in transport, six in religion, eleven in education, four in handicrafts, fifty-seven in other occupations and 2,046 males and 3,635 females, presumably mostly children, who had no occupation.

AVAILABILITY OF LABOR

On the basis of the figures in the preceding section the daily force of wage laborers about 1937 is estimated at less than 750. Excluding the contract laborers recruited from other islands, it is estimated that the equivalent of about five hundred Ponapeans and resident out-islanders were employed daily as wage laborers. The total number of natives accepting employment for wages was considerably larger because of the number engaged on a casual basis and for contracts of less than a year. These numbers may have doubled by 1942. The production of cassava, vegetables, rice, and paper pulp expanded rapidly, particularly in Palikir, for the support of the growing Japanese population. Work on various military projects began, and more females were taken as domestic servants and mistresses. When the supply of native labor in the free market was not large enough to satisfy the Japanese needs during the war, Ponapeans were forced to leave their farms and accept wage labor regardless of their personal desires. Before the Colony was bombed in 1944, almost all able-bodied men and women on the island were employed in forced labor.

The main source of contract labor on Ponape are the out-islanders. Ponapeans themselves have shown little interest in regular wage labor, not because of laziness or a desire for idleness but because other obligations that are regarded as more important than money prevent them from being away from their farmsteads for long periods of time. Ponapeans regard wage labor as a source of extra money for the purchase of imported goods that they need, but they have not accepted it as a means of earning a living. There is no reason to believe that the period of forced labor during the war, when they had to accept wage labor as a livelihood, has made them feel any more favorably disposed toward it. It is more likely that forced labor, which was resented, has had opposite effect, an evidence of which is their satisfaction in being allowed to return to their own farmsteads. The U. S. Navy and U. S. Commercial Company had real difficulty in trying to raise their combined native payroll on Ponape much more than 150 men. With an estimated 100 addi-

tional men employed on Eniwetok and Kwajelein, a total of about 250 in the entire Bureau were employed for wages during the last half of the first year of occupation. Even the out-islanders were far from unanimous in wanting to work for wages because of the need of growing food and replacing goods destroyed during the war, but there was no other source of income. Of the 250 so employed, only about 10 were Ponapeans.

Except for the period of forced labor, Ponapeans have usually worked as casual laborers. They worked three or four days for wages and then returned home to take care of their farms, to fish, and to do the odd jobs about the house that normally consume so much of their time. For this reason it has been easier to recruit Ponapeans as dock hands, for example, than as plantation hands or on other jobs where regular work is required. The Nambo Company adjusted their program on the Matālanim plantation to this situation by recruiting Ponapeans by subdistricts and working them in six shifts over a three-week period. Laborers from the first subdistrict of Matālanim worked Monday, Tuesday, and Wednesday; those from the second subdistrict worked Thursday, Friday, and Saturday. In the same manner the second week was split between the laborers from the third and fourth subdistricts, and the third week between those from the fifth and sixth subdistricts. After three weeks the cycle began over again. If any individual wished to work more than three days out of every three weeks, he might report with people from another subdistrict. In this way Nambo always had a force of from twenty to thirty casual laborers on hand to supplement the gang of regular contract laborers recruited from Saipan and the Mortlocks. In addition, as has been mentioned, about fifty women were employed on a casual basis after 1937 to cut copra. Another method of employing Ponapeans that might be acceptable would be to recruit them from all over the island by district or halves of districts for periods of two weeks.

In calculating the labor strength of Ponape it can be assumed that most Ponapeans are unwilling to devote more than one day a week to wage labor, and many will give even less. A Ponapean's interest in wage labor even on a casual basis depends upon the amount of land and the number of coconut trees he owns, the price of copra, the size of his family, and the standard of living he wishes to provide for them. Many families were accustomed to earning all the money they needed by producing copra, without having their subsistence activities interfered with, being prevented from participating in prestige competition, being taken away from their families, or being forced into set hours of work.

It is apparent that one of the important objections to wage labor on the part of Ponapean men is a dislike of working steadily at the same task without any change. Doing the same thing all day long makes even light work burdensome, and when on their own farmsteads Ponapeans vary their tasks. The regular hours of work make wage labor a routine affair, but by shifting working gangs from one assignment to another, the interest in the job and the energy and effort that is put into it is increased. Another objection, specifically to contract labor, is that if Ponapeans must be away from home five or six days a week there is no chance to produce yams or to participate in prestige competition, and very few have been willing to withdraw from this for long periods of time. A related and equally important factor is the Ponapean's attitude toward his own land, toward which there is a strong feeling of attachment although it has been "privately owned" for only about thirty-five years. Any program that would force Ponapeans into wage labor or in other ways divorce them from their land would be resented and would almost certainly have unfortunate results.

The recruiting of wage labor is affected also by the Ponapean pattern of modesty. Unlike the out-islanders, who by comparison seem aggressive, the Ponapeans wait to be asked personally to come to discuss the possibility of a job. They consider it forward to go to an employer seeking work. In interviews they consider it as boasting to admit their qualifications for work. As has been indicated, this pattern is modifed by some Ponapeans in their contact with Americans, whom they recognize to have their own ways and who cannot be expected to understand customs on Ponape, but this modification of behavior was unnecessary in dealing with the Japanese. For many of the older men, to be asked through a Ponapean interpreter to discuss their skill or experience in a particular line of work is extremely embarrassing and shameful, not unlike being asked to undress in public.

This difficulty is in part a verbal or linguistic one, since the nearest Ponapean equivalents of English words for various occupations are used only in reference to experts and imply great skill. If a native is asked whether he is a carpenter (sǫ̆usę̆), he would be boasting if he said yes. The same is true with admitting that he is a fisherman (sǫ̆usę̆th, sǫ̆unlaith), a canoe builder (sǫ̆upal) or even a farmer (sǫ̆umwą̆t). If questions are properly phrased they can be answered without embarrassment.

For example, the Protestant Church on Ponape, an imposing building of concrete, was built by a Ponapean who is known as the best carpenter on the island. If a Ponapean, or perhaps even an American, were to ask him "Are you a carpenter?" or "Can you build me a house?" he would answer "No." If the question were "Can you build me a desk?" the answer might be either "No" or "I will try." If he were approached with "I need a good carpenter. Can you tell me where I can find one?" the answer would probably be "Oh, I am sorry. There are no good carpenters on Ponape." On the other hand, if he were asked if he built the Protestant Church, or any other specific building or piece of furniture he actually constructed, he could say "Yes" and let his work speak for itself. Similarly, even the best fisherman will deny being a sǫ̆usę̆th or sǫ̆unlaith or that he knows how to catch fish. But he can admit or even mention of his own accord that he caught 200 fish today, that he has a license for fishing and for selling fish, and that he knows where the different kinds of fishes live.

Questions phrased so as to avoid use of the terms for experts and any judgment of present ability (such as is required in answering a question beginning with "Can you do . . . ?") can usually be answered. This rule will not cover all cases however. There may be instances of individuals who react like the man who would not name his clan for fear of boasting. The carpenter, tailor, interpreter, or common laborer prefer to make no claims about their ability but, after being given a chance, to let their work speak for them. Then if it is good, they like to be told so, even if they must deny it.

Both Ponapeans and the out-islanders living on Ponape have a reputation for their ability to learn quickly. Those who are in a position to make com-

parative judgments say that they are noticeably quicker in mastering new ideas and new techniques than are the natives of the Marshalls, the Marianas, or other parts of the Carolines. It is said that the Japanese, who recognized this aptitude and regarded it as a threat to their position of dominance, took special pains at times to conceal how things were done because they had seen natives learn how to do something fairly complicated simply by having watched a Japanese do it.

This ability and interest in mastering new techniques is directly related to the value placed on versatility and proficiency in a variety of activities. Apparently it is not accompanied by a desire to continue to employ the new technique or to advance to higher paying jobs. A European employer describes the natives as showing great interest and working very hard at a new assignment, such as learning to run a boat, and then, as soon as it is mastered and has become routine, losing interest and working only half-heartedly, or trying to find something new to do.

Another characteristic ascribed to native labor is that they are unsteady. It is said that they will work very hard for several days and then fail to show up at work without warning, causing the employer inconvenience and delays that may be expensive. This is true not only of the Ponapeans, but also of the outislanders who accept work as contract laborers. Feasts, good fishing weather, things to be done at home or on the farm, or other unpredictable situations result in absenteeism or tardiness without advance notice. This was a noticeable characteristic of the U.S.C.C. laborers, although in their case it was exaggerated by the necessity of providing food since wages did not include meals. On the days when contract laborers arrived from and departed again for Kwajelein less than half the labor force at the Experimental Station showed up for work.

Seasonal variations in the availability of labor are reflected both in absences from work without notice and in the difficulties of recruiting labor at certain times of the year. During the seasons when yams are planted, when yam vines are tied, when feasting is in full swing, when the l1li feasts are held, and when pit breadfruti is made, it is said to be almost impossible to employ Ponapeans.

One of the striking characteristics of the Japanese program was the manner in which economic development was coupled with colonization. In this the Japanese differed from most colonial powers operating in the tropics. Until about 1930 the Japanese were dependent upon the labor supply in the islands, but thereafter native labor became increasingly unimportant until the outbreak of hostilities with China and the preparations for World War II, when it became necessary to utilize fully all the manpower in the Japanese empire. That Japanese, Okinawans, and Koreans were imported into Ponape for all sorts of labor is not in itself any indication of the limitations or the inadequacies of native labor. It was a part of a larger and deliberate program to creat new economic opportunities for Japanese nationals.

CONDITIONS OF EMPLOYMENT

Before 1937 the standard wage on Ponape was the minimum wage set by the Japanese government, 70 sen (17.5 cents) a day plus food. The value of food supplied is generally accepted on Ponape as being about 30 sen, making the eeal daily wage 1 yen (25 cents). The boys at the Experimental Station received less than the minimum wage, being regarded more as students than as laborers. Before a minimum wage was established, wages had been even lower, about 50 sen a day plus food according to informants. With the expansion of the Japanese colony the minimum wage was increased to 1.20 yen (30 cents) a day plus food, and competition for native laborers during the war raised wages to as high as 3 or 4 yen (75 cents to $1.00) a day plus food.

Casual laborers lived at home but were furnished three meals a day, and contract laborers were supplied lodging as well. Policemen, postal employees, domestic servants, and contract plantation laborers all received lodging. Housing for labor was rudimentary on the large plantations. Nambo housed and fed forty employees in a two-room building; one room served as a ward room and the other as the common bedroom, with stacks of bunks.

The usual schedule of work was from 6:00 to 7:30 A.M., and then breakfast; 8:00 A.M. to 12:00 noon, and then lunch; 1:00 to 4:00 P.M., after which came the evening meal. Contract laborers worked a six-day week and about eight and a half hours a day. Domestic servants usually worked from 7:00 A.M. to 3:00 P.M. six days a week with time off for lunch. Time and a half was paid for work at night, but not on Sunday. Protestants did not work on Sunday, but since the Catholics are concentrated about the Colony, dock crews could usually be obtained for Sunday work. Other Japanese activities closed down on Sundays.

Because of Ponapean methods of cooking it was almost inevitable that food should be provided to wage laborers in addition to wages and that imported foods, such as rice, should be the basic items in the meals provided by large employers of native labor. A meal cooked on the hot stone oven takes from two to three hours of a man's time to prepare, not counting the time spent each day in gathering fresh breadfruit, yams, or their substitutes. Rice, however, can be cooked quickly and can be stored easily in quantities sufficient for a month or so. From the point of view of the employer, supplying meals made it possible to count on a full day's labor and made attendance at work less irregular than it would otherwise have been.

The advantages from the native point of view can best be seen by contrast to the situation during the first year of American occupation. When minimum wages were established for native labor employed by Military Government, it was decided that laborers would have to provide their own meals and in return would receive a higher money wage. The 40 cents a day for men and 35 cents a day for women employed as common labor was just about equivalent to the Japanese minimum wage of 1.20 yen a day plus food. (That real wages were far below the Japanese because of the higher cost of American goods is important, but beside the point at the moment.) Because employers did not provide meals, laborers frequently came to work without breakfast and they had only meager lunches, if they had any food at noon at all. As a result they were less well nourished than they would have been even on rice alone, which the Japanese usually supplemented with other food. U.S.C.C. laborers frequently requested permission to leave work early or simply stayed away from work without warning because they had to provide food for themselves and their families. The situation was so unsatisfactory

that, before the end of the first year of occupation, arrangements were being made to provide the noon meal for all native employees of the Navy and the U.S.C.C., as was already being done on Truk.

Lodging was not provided. Some of the native employees were building houses near Military Government headquarters after working hours, but others preferred to return to their own homes on Sokȫs Island and in Nȩt. No transportation was provided, though this would have been a help to them. There was no provision for lodging for Ponapeans from the other side of the island who might have been willing to work for short periods of time.

According to one source the standard price paid to tenant laborers for copra was 3 sen per kilo prior to 1937 regardless of market price, 4 sen from 1937 to 1941, and 6 sen from 1941 on. According to native informants Nambo paid its native cutters on Pakin Island 1-1/2 sen per kilo of wet copra, plus food and lodging, when the price of Grade A copra was 12 sen a kilo; later, when copra prices increased, their wage was increased to 2-1/2 sen per kilo. Other natives who were employed to clean the plantation were paid 75 sen a day, plus food and lodging.

During this same period the Etscheits were paying 70 sen a day for plantation hands, plus about 40 sen a day in food. Each laborer working on this basis was required to bring in 50 kilo of wet copra a day, but there was difficulty in enforcing this minimum. Some brought more, but others brought as little as 30 kilo, with excuses that their group of trees had been worked recently by other laborers and there were not enough ripe nuts. To increase production incentive bonuses and penalties were tried. Laborers received 2 sen per kilo in addition to their basic wage for all copra brought in over 50 kilo a day and 2 sen per kilo was deducted from their basic wage if they brought in less. With this system it was necessary to inspect the copra carefully to see that stones were not put into the bags and also to see that unripe nuts, which do not dry well and therefore become wormy, had not been picked from the trees in order to increase daily production. Unripe nuts could be caught by inspecting the copra in the drying trays; they were thrown out and deducted from the laborers' wages, but this did not replace the nuts that were wasted. On the whole, however, the incentive system was a success. Production was in part increased by broadening the labor supply, since men brought their wives and children to work to help earn the extra bonuses.

Under this system the labor costs were 2 sen per kilo of wet copra, regardless of what the individual laborer produced. Since dry copra weighs about 60 per cent of wet copra, and wastage accounts for about another 10 per cent, the labor costs per kilo of dry copra were about 4 sen. Leo Etscheit estimates another 2 sen covered bagging and other operating expenses on the plantation, leaving 6 sen or 50 per cent of the market price for overhead and profit. Each employee produced about 800 kilo and earned 17.50 yen ($4.38) plus food a month.

A number of Mortlock Islanders, who are regarded as very good and reliable laborers, were recruited to work as tenant farmers on the Nănipĕi plantations. The term of contract was six months, but many of those assigned to Ponape liked the food and conditions of work well enough to stay on for much longer periods. Those on Ant usually returned home after six months but came back to work again later on. Seven of the Nănipĕi tenants had been working on Ponape since about 1936, and another two who returned to the Mortlocks in 1946 did so only because the repatriation program offered them the chance for a free trip home.

The Nănipĕi tenants were paid half the market price, or 6 sen per kilo for dried copra when Grade A brought 12 sen, in return for cleaning, gathering, cutting, and drying; other Nănipĕi tenants who did not dry copra were paid 3 sen per kilo for wet copra. In addition tenants were provided housing and were allowed to use the breadfruit, taro, Cyrtosperma, bananas, coconuts, and any other foods except yams that were grown by or for their employer. If they wished to grow additional food of their own they were allotted land for the purpose. The tenants set their own hours of work and took off time for fishing, farming, and other activities as they liked. They could work the plantation much as if it were their own farm, spending only one or two days a week on copra if they wished, and production varied considerably. The employees on Ant are each said to have produced about a ton of dried copra a month ($12.00) whereas thirteen in Matălanim averaged only about five tons ($4.62) each. Tenant farming offers conditions of work which are attractive to the natives, since they retain a great deal of independence and can regulate their lives and their work to suit themselves. Some Japanese and Okinawan families were apparently employed on this basis on Ponape also. In addition to the tenant farmers, Nănipĕi Company also employed local Ponapeans on a casual and on a contract basis at wages of 70 sen a day plus food, with no set amounts to be produced.

On the Nambo Plantation in Matălanim natives recruited from the Mortlocks and Saipan were employed. When the plantation was being established two groups of twenty men each from Saipan were brought for six-month periods to plant the coconut trees.

POLICIES AND REGULATIONS AFFECTING WAGE LABOR

The basic regulation affecting wage labor was the government-established minimum wage. In addition, contracts between native laborers and employees, except those for periods of not more than one year, had to be registered with and sanctioned by the Branch Bureau. The comprehensive Japanese labor provisions for mining on Angaur and for the sugar industry in the Saipan District were not applied to Ponape so far as is known. In the 1931 Report to the League of Nations it is noted that there is no regulation covering forced labor, except those for intimidation or false imprisonment, and that "no case of forced labor has ever occurred."

During the war, as has been mentioned, forced labor was required by the government. This is said to have begun as early as 1932 when males were required to devote half their time to work for the government, with pay, on roads, harbor improvements, and other public works. The other half of the time they were free to work their own lands. This ratio was reduced to one week at home for every two weeks on government work when construction on the airport near the Colony was begun. The date of this is given as about 1935 or 1937, and many Ponapeans from Kiti District were employed on it. Work on the airport continued for several years and native labor was used later in the fortification of Lạngạr Island in the Colony

harbor. Eventually almost all able-bodied men and women were working full time on military projects or producing food and other supplies for the local Japanese population.

American labor provisions should include adequate regulations prohibiting forced labor by either private individuals or government. Although it cannot be adequately covered in regulations, it should be a matter of policy that no pressure of any sort should be put on Ponapeans to force them into wage labor, whether by alienation of land, taxation, methods of recruiting, or preferential privileges extended to wage laborers.

It has already been suggested by American officials on Ponape that certain imported goods be offered for sale only to employees of the Navy and the U.S.C.C. as a device to increase the native payroll. Using goods such as luxuries or services such as education to draw Ponapeans into wage labor is discriminatory if these are not available also to those who work equally hard on their own farmsteads. Preferential privileges of this sort show no respect for Ponapean's deep-seated desire to work his own land and do not permit the existence of a free labor market. If such methods succeed in accomplishing their objectives, their effects in divorcing the people from their land and destroying their economic independence are little different from those where force is employed. The test of discrimination is whether the goods or services are available to everyone on the open market.

Where a large labor force is required by the administration for projects directly benefiting the native population, it is the responsibility of the administrator to convince the natives of these benefits. Wage labor should be entirely voluntary, and the incentives should be, purely and simply, wages and the other economic benefits, such as food and housing, provided free to employees. Laborers should be recruited by offering additional rewards and not by withholding luxury items from the rest of the population.

Once the price of copra is established at a point which will provide an adequate income and standard of living (in terms of prices of imported goods) for the people as a whole, and once every native Ponapean or out-islander, is given adequate land to earn his living by copra, the wages and other free benefits can be adjusted accordingly. They should be determined by seeing what amounts are necessary to draw natives of their own free will from their farms into the labor market. To proceed in the other way and to calculate the price that should be paid for copra from the present daily wage is to put the cart before the horse. Wage labor has been a minor factor in native income in the past and in the future it will probably be even smaller.

Military Government has already shown its intention to stop recruiting natives from Ponape for work on other islands. Ponapeans had been extremely cool toward work abroad under the Japanese, but the goods brought back by the men returning from Eniwetok and Kwajelein, when practically none were available on Ponape, plus the gifts they were given by departing Americans during the great exodus of Navy men for the United States in the summer of 1946, were real incentives. Other men were anxious to go and the second group was recruited in short order. The first group liked their experience except that they were assigned to work in messes and barracks and were disappointed because they spent their time doing tasks from which they learned nothing. They also felt they were not even doing a full day's work.

The recruitment of labor from Ponape for work on other islands had some justification during the first year of occupation when supplies of trade goods were almost nonexistent, when the copra industry had not been reestablished, and when the only opportunities for money income were through work for the Navy or U.S.C.C. The needs of these two agencies alone forced a change in policy. Once the copra industry is reestablished there will be no justification for the export of labor from Ponape. In the past, labor has always been imported, and the present population is only a third or a fourth of what the island can support. Written contracts should be required and should be registered with Military Government for all labor recruited from other islands for work on Ponape, and the period of work, subject of course to voluntary renewal, should be limited to one year.

It is possible that there may be justification for reimposing the former restrictions on kava drinking, but there is no basis for such an action in the present evidence of its effect on native work habits or welfare.

COOPERATIVE, FAMILY, AND INDIVIDUAL ENTERPRISES

The cooperative work groups based on the clan and on the Minimin or cooperative (see chapter 9) both work for the benefit of specific members of the group, and the goods produced become the property of private individuals over which the group as a whole can exercise no control. The clan assumes the function of a cooperative work group only in connection with major tasks which occur infrequently, whereas the association makes the major contribution to the regular everyday tasks of copra production and subsistence agriculture, with the exception of yams and breadfruit, as already noted.

On certain occasions the section and the district also form the basis of cooperative work groups. In some cases the goods produced belonged to the chiefs (e.g., wărasap, Imwănai) and were a form of tribute; in others they belong to the group as a whole and were used either for the common good (e.g., năs en kŏusap, măr en kŏusap) or by individual members for their own private benefit (e.g., wăr en kŏusap, ŭk en kŏusap). The groups that engage in certain types of fishing with hand nets (năikętik, năikalap, lŭkŏuk) are also based on the section; in former times this was also true of fishing at the section fish weirs. In general each individual's catch was his private property, but provisions were made for sharing with "drivers" whose functions prevent them from catching any fish for themselves.

The fishing teams, using the seines, might be composed of individuals from the same household or the same extended family, or they might simply be neighbors. These teams tended to develop into fairly stable groups, although the owner of a seine or the individual whose turn it was to use the section seine might invite anyone he chose to accompany him. By and large the predominant form of labor was that of individual enterprise, particularly before the development of the Seisan Kumiai. The sex division of labor prevented man and wife from cooperating in the daily tasks and each operated within his own sphere. A man cleared the land in the mountains for his wife to grow her crops, but although husband and wife might be in the mountain farm at the same time, the husband planted his crops

while the wife planted her own. Even when a family goes out together to gather trepang or shellfish or to catch Samoan crabs the husband and wife each own their own catch separately.

The Ponapean pattern of early rising was still being followed at the turn of the century. People started getting up about two and three in the morning and everyone was at work before the sky began to get light. Even today most people are up at five, although some have taken to sleeping until six and seven, and if they have been at a feast the night before where they have both eaten and drunk kava they may sleep until eight or nine. Sleeping late in the morning is still regarded as shameful and the man and woman who gets up earliest is praised.

A woman's first task on arising is to take her morning bath and carry water for household use. She sets out with her water containers, accompanied by her daughters who are old enough to walk. Her next concern, if she grows tobacco for her husband, is to pick the cutworms off the plants. This must be done before any other work and she cannot take time off even for resting or eating until the work is finished. A man's first task is attending to his yams; this work was completely finished before dawn in the earlier times. Today men are starting out to work in the farmstead, to fish, or to hunt in the mountains at 6 o'clock, just as it is getting light. Many families have no early morning meal except for hot tea or coffee on arising, and their first solid food may be when the man returns to the house at 12 or 2, or, if it is an off season for farming, at 10 or 11 or even earlier. Some families have adopted the custom of breakfast at seven or eight. Men's fishing, farming, and hunting alternate with the weekly variation in the tides, but all three usually take place in the morning. The fishermen go out with seines and spears and adjust their techniques to the height of the water on the reef. Women, however, fish or gather crabs almost daily but can do so only when the tide is low. Accordingly they may have to fish in the afternoon and farm in the morning, or vice versa.

When fishing and farming are completed and men and women have returned to the house, they turn their attention to housework, handicraft, tending livestock, and the various odd jobs that have to be done about the house. In the evening husband, wife, and children go down to the stream together for their evening bath. At about four in the afternoon the man prepares the hot-stone oven to cook the food that has been gathered for the evening meal. This is the main meal of the day, and when it is finished the family usually retires directly to bed.

The evening meal comes at about seven and bedtime at eight, though formerly these were an hour earlier and people went to bed just as it got dark. The family lie in bed talking until they fall asleep. This is the time when the husband tells legends to his son and the wife instructs her daughter in medicine and charms. On the night of the full moon or a week thereafter the family may go out to catch Samoan crabs, or when the moon is bright they may sit up talking until 10 or 11 while the young men go out to visit their companions. Girls are not permitted to go out at night and stay close to home talking with their parents. When yam vines are sprouting a man brings home hibiscus poles and sits up at night preparing poles and bark to tie the vines early the next morning, a task that can be done even in the dark.

With this schedule, a man does only about two hours of "work" (thọthọk) a day, according to the Ponapeans. This is not because he spends his time in "idleness" (thangänga) or "rest" (kọmạl) or even in "sleep" (mäir) It is because so much of the day is spent on tasks which we will call "busy work," but which the Ponapeans speak of, literally, as just the opposite, "not busy" (sọupïsạk), and as tasks that do not have any "object." "Busy work" is quite different from "work," which for a man means making sennit, clearing fields, planting and gathering yams, breadfruit, and coconuts, cutting copra, or working for wages. If a man does none of these he may say he "hasn't worked" during the day when he has actually made 400 yards of twine for a fish net or has been out fishing for six or eight hours. Fishing, net making, planting bananas or other crops, making canoes, making baskets, preparing hibiscus for yam tying or other purposes, cooking, building and repairing houses, making pigpens—all these and most other men's tasks are not "work" but only "busy work" (sọupïsạk).

Similarly a woman who has just completed a skirt, a fan, and two baskets may say she has not been doing anything all day. Women's "work" is limited to cooking (which is not "work" for men), all kinds of farm work, water carrying, twisting sennit, and formerly the making of the old mats (lọs). Making new mats, baskets, skirts, fans, fish nets, or any other form of handicraft, fishing, cleaning the house, feeding chickens, tending children, or washing clothes are only "busy work."

A man of thirty, working on his own farmstead, is estimated to spend on the average about two hours at "work" in the farm, two hours in eating, three hours at cooking ("busy work"), four and a half hours at other "busy work," two hours at "rest" or "idleness," a half hour bathing and dressing, and ten hours in bed. A woman's day involves about three hours at "work" in the farm, two hours in eating, one hour in cooking ("work"), a half hour in housecleaning ("busy work"), two and a half hours at fishing ("busy work"), two hours at other "busy work," one hour in bathing and carrying water ("work"), two hours at "rest" or "Idleness," and ten hours in bed.

About a half hour is spent at "rest" after eating, and when engaged in real "work" it is customary to stop for a few minutes every half hour or every hour to "rest" and cool off. When working for themselves, Ponpaeans vary their tasks so that "busy work" and "work" are mixed, or so that a man "works" for a while at planting yams and then shifts to "work" in cutting copra. This keeps their activities from becoming routine, boring, and burdensome, and makes them less unpleasant to perform.

Through missionary influence, Sunday is a day of worship and rest or idleness. Protestants cannot cook in the hot-stone oven, go fishing, do farming, wash clothes, build canoes or houses, make baskets, or even gather breadfruit. On Saturday enough food is gathered to last over Sunday, but if necessary women may fry or boil food, and papaya and soursop can be picked. In the Spanish period Protestant taboos on work were even more inclusive. Cooking of any sort and even lighting a fire was taboo, children could not play games, and the family could not even use their canoes or go visiting. Aside from the time spent in church from 8:00 A.M. to 12:00 noon, and 3:00 to 5:00 P.M. (this schedule is the same today), everyone sat about just doing nothing. They did not pray or read the Bible, but even the children had to sit quietly without making any noise. These prohibitions are not imposed on

Catholics who can farm, fish, cook on hot-stone ovens, make a feast, engage in wage labor, and even keep their stores open on Sunday.

MOTIVATION AND REWARDS

The picture of the South Seas island native lying under a coconut or breadfruit tree waiting for its fruit to fall can be dismissed as imaginary even for a fertile island like Ponape. This picture was false even before the introduction of some of the worst plant pests, such as lantana, which make farming difficult. Not only do farming and fishing, and even the gathering of wild foods in the mountains, require time and energy, but also food preferences, standards of social evaluation, and patterns of hospitality mean that the foods that are most easily available are not necessarily those that are eaten. The Ponapean attitude toward the Japanese because they ate snails is only one obvious example. Even with the most desirable foods the many varieties of yams and breadfruit are rated in terms of preference, and the obligation of a host to provide good food for his guest may mean that he goes hungry afterward.

It may perhaps be true that the entire population of Ponape could be supported wholly by the gathering of wild foods, but the question has no bearing on the actual economic picture in Ponape, in which wild plants are minor in importance compared to cultivated ones. Ponapeans admit that there are lots of wild food waiting only to be gathered, and that a person could live without planting anything. The fact is, however, that no one does so and that a man who grew no yams would be laughed at.

Similarly an interpretation of motivation and rewards simply in terms of the satisfaction of physiological needs is inadequate, since it does not explain, for example, the extra labor that is expended to produce large yams. The fact that prestige can be attained through contributions to feasts gives Ponapeans a motivation to work beyond the point at which their basic subsistence needs are satisfied, even in terms of their preferences in food. Prestige competition through feasting where yams, pit breadfruit, pigs, and kava are the elements that count is almost completely independent of the money or commercial economy. The system of prestige based on wealth, however, has become an integral part of the commercial economy and affords an incentive to work for wages and to produce copra. Motivations toward work have been modified through the growing importance of property ownership. There has been an increased emphasis on productive work since the German period when copra production was taken seriously for the first time. Earlier, in the Spanish period, the older men would often spend the entire day, from morning to evening, racing model canoes, or teams of men in canoes would engage in mock warfare with slings (pāi) while the audience watched from the shore of the lagoon. These and other sports have disappeared since the German period because people have been busy planting coconut trees and making copra.

Production, industry, and early rising, per se, are now socially valued. One of the greatest shames for a woman is to have a husband who is lazy and a poor provider. Such a woman will work extra hard herself so that she can keep a full basket of food in the kitchen. The compliment that a woman is most anxious to hear is that her husband is very industrious, that he is a good provider, or that she has lots of food, even though she must contradict or deprecate such compliments and praise when they are offered. Although the standards are somewhat arbitrary, the growing of large yams is regarded as evidence of industry as well as of skill and generosity, and if a man can keep pit breadfruit until it is very old this indicates that he produced enough each year so that he does not have to use up his reserve. Similarly the serving of leftover foods to guests is evidence that the husband provides a great deal of food. Although these are, as usual, offered with an apology, "I'm sorry, but all we have is some breadfruit from three days ago," the guest is impressed that the family has enough food not to have to eat all that was prepared and that they do not have to deplete their reserves in the gardens in order to entertain guests. When he comments on the fact to others, it is in the spirit of praise rather than criticism.

The major forms of men's "work," producing yams, breadfruit, copra, and labor for wages are all directly connected with the two systems of prestige. Fishing, however, which makes an extremely important contribution to the subsistence economy but does not enter into prestige competition, is "busy work," as indicated above. There are some exceptions, but the general correlation between "busy work" and subsistence activities, on the one hand, and "work" and the methods of acquiring prestige, on the other, is apparent.

SPECIALIZATION

As is indicated elsewhere, almost every activity, crop, and tool or instrument, is regarded as belonging either to men or to women. The line of division is sometimes sharp, and sometimes indefinite, including either men or women. The division of labor by sex is still important today, and there are many things a man cannot do without being laughed at. For an American staying in the Colony it may seem that the divisions are commonly disregarded, until he learns to distinguish between Ponapeans and the out-islanders, among whom the lines of division are slightly different.

The general basis of the division of labor is that men do anything involving climbing or very heavy work, but some of the rules are arbitrary. A man cannot carry things, such as bottles, tied together in pairs. Women carry bottles in this way, slung over their shoulder, and their baskets hang from their shoulder or are carried in the hand. Men carry a basket which rests on top of the shoulder or is carried in the hand, and generally use the carrying pole. Women can use the carrying pole only when bringing water in containers suspended in pairs.

Both men and women share in agriculture, but the most important crops are the work of men. Both men and women do fishing, and both make important contributions to the diet. Women are primarily responsible for tending domestic animals, although both men and women own them. Men alone hunt and trap wild birds and animals. Both men and women cook, but men prepare the main meal of the day. Men alone build canoes, but men and women can use them either separately or jointly. Both men and women took part in building the old native house, each having separate functions, but the modern houses are build by men.

Copra is traditionally men's work, but during the early part of the war when copra was still being exported and the men were being drawn into forced labor, women began to produce copra on their husband's farm-

steads. A few women were also employed in copra manufacture on the Nambo Plantation. For copra the old division of labor by sex showed signs of breaking down, and informants thought that women might help their husbands in copra production in the future. For other crops the line of division seemed to be indefinite when a crop either had been introduced recently or had not yet become important in the native economy so that no set pattern had been established: sweet potatoes are such a crop.

Specialists or experts were known in a number of fields in earlier times. There were farmers (sǫ̆umwạt), traders (sǫ̆unạt), housebuilders or carpenters (sǫ̆usẹ), canoe builders (sǫ̆upal), navigators or "Captains" (pali), fishermen (sǫ̆usẹth), divers for sponges (sǫ̆uthu), seine makers (sǫ̆uũk), mat sewers (sǫ̆uthẹ), tatooers (kathinting), drummers (sǫ̆upik), dancers (sŏupwarik), diviners or "prophets" (sǫ̆ukop), those who knew legends (sǫ̆upạth), those who knew prayers or incantations (sǫ̆uwinäni), medicine men (sǫ̆uwini) and women (kathinwini), midwives (sǫ̆unkạnäitik), men who pounded breadfruit to make lĭli (sǫ̆uli) and those who squeezed coconut milk over it (sǫ̆upĭa), those who divided food at feasts (sǫ̆unẹ), warriors (sǫ̆unpẽ), and chiefs (sǫ̆upẽithi). There were also special terms for weavers, singers, and probably many other categories as well. As has been indicated, these terms refer as much to an individual's skill as they do to his occupation.

Today on Ponape there are tailors, seamstresses, carpenters, boat builders, canoe builders, barbers, midwives, "engineers," former laundrymen, one electrician, and one blacksmith. Since the German period people have generally made their own canoes; previously they called in the canoe builder who sat and directed the work, which was performed by the clan members. He did no work himself, and was sometimes referred to as the "sitter of cutting" (mŏth ẹn pal). Carpenters are still important craftsmen, although today many people know how to build a house and may completely dispense with their services.

8. THE AGRICULTURAL ECONOMY

At the present time the economy of Ponape is a diversified combination of farming, fishing, animal husbandry, gathering, and hunting, supplemented by the purchase of imported goods with money obtained through cash crops and wage labor. Local handicrafts have declined markedly since contact, but cannot be entirely disregarded.

Ponapean economy has three aspects, which may be spoken of as the subsistence economy, the prestige economy, and commerce. A number of commodities are produced primarily or even exclusively for local consumption; they are usually consumed by the members of the producer's family, and seldom enter into local trade. Although many of these subsistence commodities have little commercial value and offer almost no possibilities for development for export, their basic economic importance cannot be questioned. The prestige economy is aimed at social advancement and at the acquisition or exercise of the social privileges of rank but its economic implications are obvious. The third category includes those commodities and services that are sold in order to buy the imported articles for which Ponape is now dependent on the outside world.

In the subsistence economy fresh breadfruit, yams, and sea food stand at the top of the list of food stuffs. In the prestige economy, large yams, pit breadfruit, kava, and pigs are of primary importance, and, although they are usually consumed at feasts, they also contribute to subsistence. The new system of prestige competition, based on the ownership of wealth, is related to commerce rather than to subsistence. Commerce was completely dominated by copra from 1870 to 1930. Before 1930—or perhaps even before 1935—exports of bonito and fibers were negligible, but by 1940 they had surpassed copra, which was decreasing in value because of the war.

The rapid growth of the importance of fibers and bonito and the corresponding decline in importance of copra in the total economy is evident in the partial figures available (see table 14).

A number of economic enterprises, large and small, were in the hands of the Japanese before the war. Some of these depended for their market on the local Japanese community, whereas others were in the form of exports to Japan. Some of these enterprises, perhaps including fibers, seem to have been the direct result of World War II. Japan was cut off from her normal sources of supply and had to find new places from which to obtain raw materials and sometimes had to accept inferior materials as substitutes, while the local Japanese population on Ponape had to become self sufficient in many items. Those enterprises that depended on wartime conditions for their existence will be difficult if not impossible to reestablish in normal times.

FARMING

Farming, which ranks even above fishing in importance, is the basis of the economy of Ponape. Gathering of wild foods also contributes to the diet, but food gathering is of less importance than farming. The importance of wild plants has been greatly exaggerated by some writers, such as Yanaihara (1935) in the following account:

> The chief diet of the Ponape Islanders is the yam: coconut and breadfruit are of less importance. All of these grow wild in the fields and on the mountains and the islanders merely collect them. Sometimes yam and kaba are cultivated, but the cultivation is simple in the extreme and requires no fertilization or farming. A hole is dug in the ground with the help of a stick and the yam tuber is planted and left to grow. When the plant has grown to a certain size, a branch of a tree or a bamboo is attached to the plant to let the runners twine around. Agriculture as we know it is unknown to the islanders. (p. 67)

Although the steps in yam farming are few, as Yanaihara has described, fertilizer is used and skill, knowledge, and care are required to produce yams of the size used for prestige competition. Many varieties of breadfruit grow wild in the mountains, but most of the breadfruit that is eaten comes from trees that have been planted. Yams of certain types, which the Ponapeans distinguish by the group names "Western yams" (4) and "palai" (36) grow wild, but some of the former are cultivated. None of the varieties of what the Ponapeans regard as real yams (3) can reproduce themselves except the few which have "vine seeds," and even these grow only in places where they have at one time been planted.

In the analysis of the vegetable foods used on Ponape the distinction between wild and domesticated plants is of little value. Yams, breadfruit, Alocasia, Cyrtosperma, taro, bananas, and other foods have many varieties, some wild and others cultivated. Varieties not growing wild include some that cannot reproduce themselves without being planted and cultivated and others, which presumably might grow wild, that have only recently been introduced from other parts of the world. Furthermore, "Western yams" and Alocasia, which grow wild in the mountains, are often taken home and cultivated by persons who are particularly fond of them. For these few individuals either wild or cultivated plants may be more important as sources of food.

In the following two chapters, therefore, both wild and cultivated plants that are used as food, beverages, and stimulants are discussed. The wood, leaves, fibers, and bark of these and other plants and trees are used in constructing houses, building canoes, making baskets, and in other forms of handicraft. The discussion of these uses has been reserved for the section on forestry (see chapter 11). In addition to the plants grown for food purposes, kapok, cotton, bamboo, ilangalang, and derris root are also cultivated, and lantana, pātau, gourds (pwilel), and rubber have been cultivated in the past.

Aside from copra there has been little commercialization of subsistence foods. Small quantities of breadfruit, bananas, and vegetables have been sold or bartered

TABLE 14

Value of Exports from Ponape Branch Bureau

Year	Copra	Fibers	Bonito	Total exports
1902	152,460 marks[a]	---	---	166,158 marks[a]
1924	168,660 yen[b]	---	45 yen[c]	---
1936	433,998 yen	3,504 yen	389,008 yen	1,071,294 yen
1937	784,478 yen	26,467 yen	452,831 yen	1,546,609 yen
1940	377,701 yen	825,996 yen	1,001,163 yen	2,850,437 yen

[a]These figures may include Truk.
[b]Value of annual production.
[c]Value of annual catch.

with foreigners since the visits of the whalers in the pre-Spanish period. This trade was on a minor scale even when the Japanese colony outnumbered the natives. Trade in subsistence foods among Ponapeans has similarly never been on a large scale, since families with farmsteads of their own have normally grown what they needed. The Japanese were in the process of developing an export trade in pineapples. Attempts were also made with cassava, alcohol from sugar cane, and, on a smaller scale, with tropical fruits such as mangoes, and breadfruit. For the future, cocoa seems to hold promise.

Under the Japanese, the Agricultural Experiment Station established by the Germans was rebuilt and expanded under the name of Tropical Industries Research Institute, Ponape Branch. Though its emphasis was shifted, the potentialities of a number of commercial plants were investigated. In addition to a botanical garden containing tropical trees and plants from many parts of the world, the grounds contain stands of imported varieties of cinnamon, clove, nutmeg, vanilla, coffee, cocoa, mango, mangosteen, citrus, cashew, and lichee nuts in numbers that indicate systematic investigation, which was under the direction of Moritaro Hoshino, now repatriated to Japan. The experimental and meteorological records of the Station, which were turned over to Military Government, and Mr. Hoshino himself should be able to provide valuable information on the commercial possibilities of these plants on Ponape. It is unfortunate that neither could be consulted before this report was written.[4] The Station grounds and buildings on Ponape, moreover, and the plants themselves are available for further experimentation, having survived the bombing of the Colony with little damage, unlike the Institute's headquarters at Palau, which were completely destroyed.

The Japanese on Ponape grew a variety of foods for their own use. In 1934 small government-subsidized truck gardens were started in Palikir, and during the war this activity expanded until the island was almost entirely self-supporting. Sweet potatoes and cassava seem to have been the most important staples, but many other plants were also grown. In addition to pumpkins, squash, pineapple, papaya, sugar cane, watermelon, onions (nigi and nira), cucumbers, beans, eggplant, and coffee, which are listed under Ponapean crops below, the Japanese grew tomatoes, green peppers, okra, mitsuba, spinach, kohlrabi, cabbage, lettuce, a kind of parsley, water cress (mizu napa), turnips, radishes, carrots, peas, peanuts, soya beans, and rice. Of those in the latter group, at least lettuce, peanuts, and rice had been planted in small quantities by the Germans.

Although rice has been known and used by Ponapeans since the Spanish period or earlier, and although both men and women were forced to learn how to grow wet rice during the war, the cultivation of rice was not adopted. Rice is very well liked as a food, but the work in the paddy fields, with its long hours and hard work, was probably the most disliked and resented of all the forms of forced labor required by the Japanese. The largest Japanese paddies were in Matālanim District, with other important ones in Palikir and near the Colony. In 1937, before World War II began, 26 hectares were planted to rice on Ponape and 36.4 metric tons valued at 7,280 yen were produced.

Reports of Japanese experiments on Ponape indicate that the best adapted rice varieties from India, Java, Formosa, and the Ryukyu Islands, which are resistant to blast fungus, are Soro, Boku, and ADT3, and the best Japanese varieties, which mature in half the time or less, are Nakamura, Yokichisen, Shinriki Iyosenseki #2, and Kichibiho. Willard Price reports that Hoshino showed him a cross between Indian and Japanese rice which was superior to both. Seed samples of a number of varieties of rice are among the collections of the Experimental Station. Ponapean informants report that the cutworm (mwĕ̆athi) was particularly troublesome in the rice paddies, and that each laborer was required to collect them the first thing each morning and had little trouble getting a bucket full.

In addition to wet rice, dry rice was cultivated by the Japanese without the help of Ponapean labor. This is said to have grown well in any field and to have borne lots of grain. Some Ponapeans tried to save dry rice as seeds, but all were destroyed by small birds (likăthpŭpŭ) and a weevil that also eats rice after it has been harvested. These two pests affect paddy rice also. If they can be controlled, it is possible that Ponapeans can be taught to produce their own rice, which would eliminate the necessity of importing it, but it seems extremely unlikely that Ponapeans can be induced to cultivate wet rice.

Forty-two local plants, recognized by the Ponapeans as being different, enter into the diet. A total of 430 native varieties of these 42 plants were recorded, of which over half are varieties of yams and breadfruit. It is estimated that there must be more than 500 native varieties of plants utilized by Ponapeans for food purposes.

[4]A manuscript by M. Hoshino, reporting results of agricultural investigations, was made available to the Survey and has been translated in part and used in this study.

Farming today is almost exclusively confined to the privately owned land about the house. Before the Japanese placed restrictions on the use of other land, mountain farms and fresh-water marshes were used to supplement the farmsteads. The fresh-water marshes were used for Cyrtosperma which requires very wet land, not available on many farmsteads. The mountain farms were used for yams and Alocasia, the cultivation of which is regarded as men's work; bananas, which can be grown by either men or women; and taro, "Hawaiian taro," sugar cane, and corn, which are cultivated by women. Most women's farming was done on the mountain farms, whereas the important crops of men were grown largely on the farmstead. On the farmstead men planted breadfruit, coconuts, yams, Alocasia, and occasionally mangoes; and women grew pepper, onions, and sugar cane near the house so that they would be handy for eating.

Mountain farms were prepared by men during the trade winds, between December and February. First the weeds and brush were cut down with a knife, a process that took about a week for a mountain farm of the usual size. The weeds were allowed to dry for another week and then burned. If the plot contained trees too large to be cut down with a knife, dried brush was piled about their base and burned in order to kill them. Planting could begin the day after the burning, and required about two days for men's crops if the seeds had already been collected; if the planter had to hunt for seeds and cuttings in the mountains, at least another day was required. Men and women planted in the mountains at the same time, each digging the holes for his own crops. Except for yams, the plants grown on the mountain farms were those that require sun. The entire crop was harvested or transplanted at the end of the year when the field was abandoned and a new field was prepared. After one crop the land was regarded as exhausted and had to be left to lie fallow for from two to four years at the minimum, by which time it had become overgrown with grass. Unless the field had large trees growing on it, indicating that the soil was good, the fallow period was usually much longer, and the field had to be cleared of a heavy second growth before it could be used again.

Farmsteads also are cut and burned to revitalize the soil, but only when the crops fail to do well. Generally it is sufficient to do this only once every five years or so. If farmsteads are large enough, parts of them are allowed to lie fallow also. However, since all food crops have been raised on the farmstead because of Japanese regulations on farming in the mountains and in the fresh-water marshes, it has often been necessary to use land continuously regardless of the danger of soil exhaustion, which the Ponapeans recognize.

A number of different types of soil are recognized.

A. "Black soil" (pwęlitǫl) is the best for yams, bananas, coconuts, pineapples, and in fact for all crops, but it is not common enough to be used exclusively.

B. "Pebbly soil" (pwęl rakięth), which is filled with small pieces of gravel or laterite, is regarded as next best. Most plants grow well in it for one year, and then have to be replanted. It is not good for coconuts, which may stop growing at about eighteen feet and may stop bearing after twenty years. Most of the land about the Colony, including the Etscheit Plantation, is of this type.

C. "Red soil" (pwęl wäita) is better for yams than pebbly soil and is all right for coconuts and sugar cane, but it is not good for bananas, pineapple, and most other crops.

D. "Powdery soil" (pwęl ingith) is a hard-packed black or light-colored clay which crumbles into a fine flour-like dust. In it all plants grow very, very slowly and are stunted. Long yams grow short, large yams grow small, and coconuts do very poorly.

E. "Sand" (pïk) is found mainly on the small islands of the outer reef, but occasionally in small patches on the shore of the main island. It is good only for coconuts and for one variety of breadfruit (mäipä).

Breadfruit grows well in any of the first three types of soil; some wild varieties do not do too badly even in soil of type D.

In the fresh-water marshes (lędpwęl, lędpwel lę), which are used for Cyrtosperma, the soil is good and black (type A). It is covered with water that varies in depth from three inches in the sunny season to from one to three feet during the rains. Rocky places (päip), which include the outcroppings of solid rock such as the cliff on Sokǫs Island, are good only for breadfruit. There are also a number of barren spots (mall) on Ponape, referred to locally as "deserts," which have soil of type D and are not used for farming except occasionally for arrowroot.

Most of the farming is done on fairly level places. The steeper hillsides are sometimes used for breadfruit, but the soil there is regarded as inferior because so much is washed away by the heavy rainfall. In planting, a farmer looks for black soil (type A), which he uses even if he can find it only in small patches or pockets. This is possible because, except for coconuts and infrequently bananas and taro, the major subsistence crops such as breadfruit, yams, Alocasia, Cyrtosperma, are never planted regularly in rows. A small yellowïsh vine (lamwäk) is a sign of good soil. Where it is found a farmer knows that yams or bananas can be planted with the assurance that they will grow well.

The method of planting varies considerably with the crop. A number of plants are grown from seeds planted in small holes two inches deep and two inches in diameter which are made with a knife. Some root crops are grown from root cuttings planted in conical holes made by driving in a digging stick and wiggling it around to loosen the dirt. Yam cuttings are planted in mounds of loose earth formed over specially prepared holes. Yams are planted above the holes because their main direction of growth is believed to be downward, whereas Alocasia, Cyrtosperma, taro, and "Hawaiian taro" cuttings are planted at the bottom of the hole because the roots are believed to grow up. For a number of crops young plants which have sprouted from fallen seeds are simply dug up and replanted. Vines and vine cuttings, shoots, and stem cuttings are also used, and breadfruit is grown from rhizomes and pandanus from terminal buds. The holes made for Alocasia, bananas, and pandanus are sometimes as deep as 18 inches, but most things are planted 12 inches or less below the surface. Ponapeans believe that anything that is planted two feet deep will die.

Probably because of the heavy rainfall, newly planted crops are never watered. Tobacco, corn, pumpkins, and beans are shaded from the sun when they are first planted, and certain varieties of yams must be protected from the rain. Fertilizer is used only for yams. It is not used for breadfruit, coconuts, or even taro, which is fertilized throughout the atolls of Micronesia. Irrigation, if the term can be used, consists of piling up a few stones in the beds of fresh-water streams to

make pools in which Cyrtosperma can be planted. Christian describes the use of water conduits (kęrękęr) of bamboo used to "bring down water from the hills for irrigation purposes," but informants said that this practice was confined to the small island (Section K3) on which Christian resided. Artificial pollination is used for one variety of pumpkin or squash.

Two methods were used in the native period to make breadfruit, coconut, mango, and citrus trees bear more fruit. The trunk of the tree was ringed about two feet above the ground with a series of short cuts in the bark, care being taken not to make a continuous cut clear around the tree; or a few dry coconut fronds were laid about the base of the tree and burned, care being taken not to burn the bark too severely. Both these methods have been replaced by a third, introduced in the German period, perhaps by the Germans themselves; this consists of driving an iron rod into the trunk of the tree. A rod about three-eighths of an inch thick and nine inches long is used and is said to improve the fertility of a tree as long as it lives. The two earlier operations likewise had to be performed only once on each tree. Young breadfruit trees are trimmed to give them the proper shape and a cut is made in their bark so that they will grow faster. Bananas, pineapples, taro, "Hawaiian taro," and sugar cane are replanted to make them grow better. When these were grown in the mountain farms, they were replanted annually in the new fields. Yams, which are sometimes left on the farmstead to grow for a number of years, are replanted after five years for the same purpose.

There were no taboos concerning the growing of coconuts, breadfruit, taro, Cyrtosperma, or Alocasia, but in order to make yams grow well a farmer abstained from sexual relations for ten days before planting yams and for ten days before tying yam vines. Some of the men who were known as expert farmers (sǫ̊umwą̊t) and who took yam growing seriously are said to have gone without intercourse for six months before planting and for another period before tying the vines. It was also taboo to eat fish or copra before planting or tying yams. Neither the sex taboos (pą̊lisuęthinli) nor the food taboos (pą̊lisuęthęnmǫ̊nga) are observed today.

Although the fields are not weeded, the larger weeds and bushes are cut down by men so that the plants can grow better. A number of plants are particularly troublesome to farmers because of their number, their growing speed and the size to which they grow, and the difficulty of killing them. Ipomoea gracillis (ǫ̊mp), Dioscorea bulbifera (palăi), and a third vine (ɪ̊ol), which Christian identifies as a giant convolvulus, are native plants which are island wide in their distribution. They climb to the tops of coconut and breadfruit trees killing them if they are not regularly cut down; even so they grow back up again unless the roots are destroyed by burning. Lantana camara, the wild lantana of the Pacific, which has no native name except "bad plant" (tūka suwęth), was introduced as a flower from Saipan in the German period by Henry Nănipēi. It has become one of the worst plant pests on Ponape, particularly in the Ǫ̊a part of Matălanim District and the Wą̊nę part of Kiti. Attempts have been made to eradicate it by cutting and burning, but it grows up again in spite of this. In Section K19 where it was first introduced, it is not so bad; there the plants were dug up and thrown into the salt water before they had spread widely. Lantana is also a serious pest in Sokǫ̊s District.

These four plants are the most troublesome for the island as a whole, but other plant pests are found in certain parts of the island. Wedelia biflora (nǧkao) is very numerous in Matălanim District, and grows quickly. Pătau, a vine which was introduced in the German period and planted around the houses by some people because of its large yellow flowers, has gone wild and is causing trouble. Pennisetum or "Napier grass" (pokso), which the Japanese introduced for cattle feed and paper pulp, is a serious nuisance near the Colony and in Sokǫ̊s District, near Sapalap in Matălanim, and in parts of Kiti District. "Paddle grass" (rę̊ patil) was introduced by the Japanese as cattle feed and has become very bad in Palikir and about the Colony, where it has overgrown the remains of the burned-out city, but it is not found to any extent in other parts of the island. It grows four feet high and very thickly and is hard to kill. In some places another kind of Ipomoea (likăm) is also troublesome, growing to the top of coconut, breadfruit, and other fruit trees like ǫ̊mp. "Wait-a-bit" or Caesalpinia (ką̊sapal) with its sharp thorns is also a troublesome pest, particularly along the shore and on the small islands of the outer reef. One of the varieties of large ferns (rǫ̊til) is dangerous to step on barefooted, and often cuts feet and legs, leaving long slivers in the flesh. (See Fosberg's report vol. 13-I.)

Several insect pests also cause trouble, the most serious being a root borer worm which kills bananas and which was introduced in 1916 or earlier. Other pests include the taro leafhopper, introduced in 1921; the beetle and moth afflicting coconuts and sometimes breadfruit, soursop, and mountain apple; and the cutworm, which affects wet rice and tobacco in particular, and also corn and beans. Two other worms eat mangoes and improperly dried copra, and weevils eat imported rice and flour in storage as well as the rice produced locally by the Japanese. Some crops are destroyed or damaged by domestic and wild pigs, cows, chickens, rats, wild deer, and birds.

The worst pest of all, however, is the giant African snail (thę̊nthę̊nmosi), which eats everything. This has been identified by Daniel B. Langford as Achatina fulica Fer. Snails were introduced about 1937 from the Marianas by an Okinawan for use as food. They were boiled into a soup to which soya sauce, napa, papaya, and other ingredients were added. Originally snails were grown in boxes and inside fences with about three-eighths-inch mesh and were fed leaves and sweet potatoes, but they escaped and spread rapidly. Soon the Japanese government required all the school children in the Colony to gather a bucket full each and dump them into the lagoon before coming to school.

Today the area about the Colony is very heavily infested and there are many near Sapalap in Matălanim. There is a real danger that the whole island will be overrun unless some control is established. In Matălanim the people started on their own to collect and burn snails daily, but some sort of islandwide program, subsidized if necessary, is required, particularly for the marginal areas where the danger of spread is greatest but not so apparent. Ponapeans do not eat snails, which they consider revolting and unfit for human consumption, in spite of the fact that they were eaten by Japanese. The chances of controlling snails by teaching Ponapeans to eat them seem extremely remote, but there are two possibilities that are at least worth investigation. Snails can be mixed with pig feed after being boiled and shelled; this was done by the Catholic missionaries and possibly Ponapeans can be

TABLE 15

Prices of Agricultural Products on Ponape Island

Commodity	1946		1937
	Wholesale (cents per kilo)	Retail (cents per kilo)	Japanese prices (sen per kilo)
Bananas	2.5*	3.5	5.0
Breadfruit	1.0 (ea.)	---	6.0
Yams	3.0	4.0	7.0
Sweet potatoes	1.5	---	7.5
Cassava	1.5	---	9.0
"Paringve Kalaimin"?	3.0	4.0	---
Papaya	0.5	1.0	4.3
Limes	5.0	6.0	---
Pineapple	5.0	6.0	15.3

*Or 12 cents per hand.

taught to do the same. Canned snails, which were simply boiled or steamed with no sauce or flavoring added, were imported to Ponape before 1937; perhaps a market for canned or dried snails might be found that would partially offset the cost of snail gathering. If these fail, an expensive method like the use of Metag poison bait or possibly a substitute may be the only solution.

The Japanese on Ponape used hoes and mattocks in farming and plows drawn by carabao in preparing the land for sugar cane, cassava, and sweet potatoes; but the main farming tools used by Ponapeans are still the digging stick and the knife.

The prices of vegetables and fruits, established by Military Government during the summer of 1946, are shown in table 15, compared with Japanese prices calculated from figures for production and value of agricultural produce on Ponape and Truk in 1937.

As might be expected under a price schedule of this sort, where bananas cost about as much as yams, and a hand of bananas brought twelve times as much as a breadfruit, a profitable retail business grew up in the sale of bananas to natives employed by Military Government. No yams were offered for sale and breadfruit could be bought only during the season when they were plentiful, and then only by making special arrangements with producers for the purchases of large quantities. Until land is provided for families who do not have enough and until the number of wage laborers required by Military Government and other employers becomes negligible, there is a real need for a reliable retail market in farm produce near the Colony.

The chiefs of Nęt District, who are nearest the Military Government headquarters, were very interested in the possibility of adding a line of farm produce to the imported U.S.C.C. goods sold in their district store, on the basis of only a 10 per cent markup over wholesale prices. Such a step, which would benefit both the wage laborers in the Colony and the people of Nęt District, cannot be successful until the ceiling prices of farm produce have been adjusted upwards. Bananas, at a little more than 1-1/2 cents a pound retail, were profitable only because of the low wages and special circumstances of wage laborers, who were provided no meals by their employers. In fact, on an island where adequate amounts of foodstuffs can and are being produced, the removal of price ceilings on local foodstuffs including foods is to be recommended at least on a trial basis. Price ceilings on imported items, on the other hand, must be continued and enforced.

COCONUTS, BREADFRUIT, AND YAMS

The chief agricultural crops on Ponape are discussed in the following sections in order of their importance.

1. Coconuts (nī).—Coconuts are the primary agricultural crop in the commercial economy of Ponape. In recent years the value of exported copra fell behind that of bonito and fibers, but coconuts remained, as they have always been, a major source of income for the native population. In prestige they function primarily as a measure of income. Their place in subsistence economy is less easily defined. They are a source of liquid that is commonly drunk in place of water. The husks of certain varieties are chewed, the cabbage is sometimes eaten, and the flesh of the coconut is eaten in several different forms, but never as an important food or as part of the meal. The oil and the cream from the flesh, and less commonly the grated flesh itself are used in the preparation of food, but other foods, starch or protein, are the main ingredients. Coconut trees are the source of palm wine or toddy, and the uses of the leaves and other parts of the tree are almost innumerable.

Fourteen native varieties of coconut are recognized. Of these the basic varieties are seven: (a) "large dark coconut" (nī węlęk tęntęl) sometimes called simply "dark coconut" (nī tęl) which has large dark green nuts; (b) "large red coconut" (nī węlęk wāitāta) sometimes called simply "red coconut" (nī wāitāta), which has large reddish orange nuts; (c) "little dark coconut" (nī tik tęntęl), which has very small dark green nuts; (d) "little red coconut" (nī tik wāitāta), which has very small reddish orange nuts; (e) "hidden dark coconut" (nī rir tęntęl), so named because it has so many coconuts that it is difficult to see or count all of them, has large bunches of medium-sized dark green nuts; (f) "hidden red coconut" (nī rir wāitāta), which has large bunches of medium-sized reddish orange nuts; and (g) "light coconut" (nī pwętępwęt), which has medium-sized pinkish nuts and very light yellow-green leaves.

For each of these seven there is a corresponding

variety that has an edible husk (athŏl), distinguishable by the inside of the husk, which is sweet and whitish (rather than brown or orange). Thus there are (h) athŏl ẹn nï wẹlẹk tọntọl or athŏl ẹn nï tọl; (i) athŏl ẹn nï wäitäta; (j) athŏl ẹn nï tik tọntọl; (k) athŏl ẹn nï tik wäitäta; (l) athŏl ẹn nï rir tọntọl; (m) athŏl ẹn nï rir wäitäta; (n) athŏl ẹn nï pwẹtẹpwẹt. Aside from the single feature of having edible husks, these varieties have the same characteristics and uses as the varieties (a-g) from which they are named and from which they are not distinguished in the discussion of other uses of coconuts. All seven varieties with edible husks are said to have been introduced from Nukuoro and Truk since European contact, and they are not common.

The first two varieties (a) and (b), which are sometimes classed together with (h) and (i) as "large coconuts" (nï wẹlẹk), account for most of the coconuts planted since the German period, when they were introduced from Nukuoro and Truk. Varieties (c) and (d), which are classed together with (j) and (k) as "little coconuts" (nï tik), are said to date from the Native period. There are still many trees of varieties (c) and (d) on Ponape although they are no longer planted. Varieties (e) and (f), which are classed together with (l) and (m) as "hidden coconuts" (nï rir), are also said to be native. All varieties of "hidden coconuts" are seasonal and bear only during the rainy season, whereas all other varieties bear throughout the year. Varieties (g) and (n) were introduced from Nukuoro and Truk in the German period and are not common. They are planted only because the color of the leaves is pretty to look at and because the meat has a very sweet smell and a good taste. It is said that their smell can be recognized a hundred yards away when more than three or four are being cut open.

For copra the "large coconuts" (a, b, h, i) are regarded as best, and most of the larger coconut plantings are of varieties (a) and (b). They have larger nuts and thicker flesh and yield more copra per tree than all other varieties including the "hidden coconuts." For drinking purposes all varieties are used, but "hidden coconuts" are best liked; "little coconuts" are regarded as really too small; and "large coconuts" are saved for copra except when a host wishes to honor his guest with a large nut. For coconut oil and coconut cream, "hidden coconuts," "light coconuts," and even "little coconuts" are preferred to "large coconuts," which are said to be much less greasy and to contain less oil.

For most foods the same word may be used for the nut, fruit, or root that is used for the plant or tree from which it comes, but there is no single word that can be translated simply as "coconut." Separate words, which cannot be used interchangeably, refer to the coconut tree (nï), to small green coconuts (kurup), to "drinking coconuts" (ŭpw), and to ripe coconuts (mwängas), the last term being used also for copra.

To get drinking coconuts at the proper stage they must always be picked from the tree; they may be brought home for household use and to serve to guests or they may be taken to the feast house, as well as used in passing. For drinking, the tip of the husk is chopped away with a knife to expose a small section of the shell, which is removed with the knfie after its point has been cleaned by sticking it into the husk. In former times, and for politeness today, the coconut is husked before being offered as a drink. Respect is also shown to the drinker by leaving the portion of the shell attached at one side by the fibers of the husk, which serve as a hinge. The extent to which water (pïl) or the juice of drinking coconuts (pïlẹn ŭpw) is drunk depends upon the price of copra, and during 1946, when there was no market for copra, drinking coconuts were widely used.

The juice of ripe coconuts (pïlẹn mwängas), which is drunk at meals by some when copra prices are high, is prepared for use by boiling the juice of coconuts that have been used for making copra. This drink was liked by the Japanese, and there was a small trade in this commodity for a few individuals, who sold it to the Japanese community in bottles. It is brownish in color and is described as very sweet and having a taste reminiscent of molasses.

Palm wine or "toddy" (sikälui) is an alcoholic drink made from the fermented sap of the coconut tree. The top end is cut off the "buds" (tänkạl) and their sheath (kŏmạl), and the juice is caught as it seeps out. Toddy is sweet and mildly intoxicating when it is first collected and slightly sour and much stronger after standing overnight.

The flesh of the coconut is eaten raw in three forms: soft and rubbery as in drinking coconuts, solid and nutty as in ripe coconuts, and crisp and watery as in sprouted coconuts. The flesh of sprouted coconuts (păr) is the best liked and most commonly used; Christian records that when roasted it was used as a food for invalids. In none of these forms is coconut flesh important in the diet. It is not served as part of the meal; nor used as a substitute for either the starch or protein course as it is in the neighboring atolls of Mokil, Pingelap, Ngatik, Nukuoro, Kapingamarangi, or in the Mortlocks; nor is grated coconut used as commonly in cooking as it is on the atolls. The grated meat of ripe coconuts is sometimes mixed with pit breadfruit (măr) before it is baked, but it is not mixed with breadfruit or yams or their substitutes in preparing the usual starchy dishes, nor in preparing the special dishes known as lïli, ïthïth, or tẹlẹmai.

Coconut cream (piyäiyạ or matŏr), however, is an important ingredient in cooking. It may be used as a dressing or sauce on any food that is boiled, including yams, breadfruit, taro, fish, shellfish, and even chicken and pig, but it is never served with foods that have been fried or roasted. It is also an essential ingredient of three baked dishes (lïli, ïthïth, and tẹlẹmai), and of a baby food (kọurap). Coconut cream is made as it is needed by grating ripe coconuts and then squeezing out the white oil onto the food on which it is served. When used with baked food it is prepared by men by wrapping the grated coconut in hibiscus bast and wringing it out like a towel; when used with boiled food it is prepared by women by squezzing grated coconut in the fabric-like cloth of the coconut tree.

Coconut oil (lẹ̆, lẹ̆n mwängas) can be used in place of lard for frying. Since the Japanese period, it has been made by boiling coconut cream. In the early days, before frying was introduced, coconut oil was used for perfume. The oil was made by placing grated coconut in a wooden bowl (kasak) which was set out in the sun with one end higher than the other. As the oil ran to one end, it was poured off and finally the gratings were squeezed out, but this method is no longer used. There are a number of hand presses on Ponape left by the Japanese, some of which are now being used to produce oil for local use.

The edible husks of varieties (h) through (n) are chewed like sugar cane and usually are eaten only in passing. They are sometimes carried home and baked in hot stones, after which they are easier to chew, but

even after cooking they are eaten only between or after meals. The nuts are picked at the stage of "drinking coconuts" or when they are still younger and smaller, as green coconuts (kurup). Coconut husks, however, are not commonly eaten on Ponape. The cabbage (kopw, kopwin nī) of the coconut can be eaten in passing, but, since the tree is killed in the process, another palm is more frequently used for this purpose.

Although Ponapeans say there are a few coconut trees along the edge of the lagoon that have not been planted but have sprouted from seeds which have been washed ashore, almost all coconut trees on Ponape and all of those back from the shore have been planted by someone. Coconuts which fall from the tree sprout and may take root by themselves, but, except in abandoned farmsteads, these are either removed or replanted elsewhere so the trees do not suffer from growing too closely together.

The Ponapean method of planting consisted of selecting a sprouted coconut of the desired variety from a tree bearing many large healthy nuts and replanting it when the leaves were about two feet high. The roots, which were about two or three feet long at this time, were pulled up and cut off flush with the husk. It is said that if the whole root were planted the tree would be weaker and would not grow well. A hole was dug with a digging stick or knife to a depth of about four inches so that half the husk was below the level of the ground. The loose dirt was made into a small mound which just covered the top of the husk, and the sprout was supported by two pieces of hibiscus stuck into the ground on either side, to which it was tied by hibiscus bark that had been stripped from them. Coconut trees were planted so that their leaves could not touch each other, about eighteen feet apart; but they were not planted in rows and often they were scattered about the farmstead with much larger distances between trees.

A new method of planting was taught by the Germans. Coconuts that have ripened on the tree are picked and lowered carefully to the ground with a rope so that the slick greasy layer on the inside of the flesh is not loosened by being dropped and the nuts do not fail to germinate. The nuts are then laid out in the sun on special platforms built near the house. After about three months the nuts sprout, and in another four months the sprouts reach the height of about two feet, when they are ready for planting. The roots usually do not appear, or at most do not grow more than an inch or so long while the nuts are on the racks. The racks were made of āk (Rhizophora) about two feet above the ground and about three feet wide by twelve feet long. The coconuts were rested between lengthwise sticks tied to the frame about six or eight inches apart so that they did not roll about.

The nuts were planted eight meters (about 26 feet) apart above specially prepared holes. The holes were a meter in depth and a meter in diameter and were refilled with the loosened dirt, with an inch-thick layer of sand two or three inches beneath the surface. The nuts were planted so that their lower halves were below the surface, as in the Ponapean method. The specially prepared hole, which the Germans recommended as a means of shortening the time required for a tree to reach maturity, was tried by Ponapeans but was found to make no difference. Trees planted in this way still took from seven to twelve years before they began to bear, so the preparation of special holes has been abandoned. The Germans also introduced Crotaleria (kāiyanos) to be grown as green manure in the coconut plantations, and this is used by a number of people today.

Trees grown from nuts sprouted on racks were found to grow better and this practice has been widely adopted. The German method of laying out the trees in regular rows was also adopted, but the old method of preparing the ground without special holes was retained. Since the German period, some people have reverted to the old method of planting nuts that sprouted by themselves, and when only two or three trees are planted at a time they are often planted irregularly. Trees planted before the new method was learned from the Germans are still numerous also, but the majority of trees, particularly in the larger plantings of "large coconuts," are laid out in rows and were planted in shallow holes from nuts sprouted in racks. For trees planted in this way, the Ponapeans reckon 120 trees per hectare (1.01 chobu; 2.47 acres). Rats eat the young coconut sprouts both on the racks and on the ground unless they are protected by a section of bamboo set over them.

If coconuts are planted in "good soil," they will bear for sixty years or more; if they are planted in poor soil, they may die after bearing only a few years. Informants over fifty-five years old knew of bearing trees that were planted before they were born. The coconut is regarded as one of the slowest growing plants on Ponape. When planted in good soil they mature in about seven years; in the few sandy places on the main island they mature in the usual period of between seven and twelve years. On the small islands of the outer reef, and on the neighboring atolls like Mokil, Ngatik, Ant, and Pakin, where coconuts grow best, they are said to mature in as little as four or five years and to bear more nuts per tree. Although there are a great many coconut trees on Ponape and copra has always been the primary source of their income, Ponapeans recognize that their island is not a good place for growing coconuts. In general the mountainous parts of the island are regarded as inferior to the coastal farm lands for coconuts, because the rain washes away the good soil from the hills.

Certain symptoms are recognized as showing that a tree is suffering from the quality of the soil. First the bottom and outside leaves, then the middle leaves, and finally the new leaves at the top turn yellow, and the tree becomes barren. To revive a tree that is bearing few fruit because of the soil, an iron rod may be driven into the trunk or dry coconut leaves may be burned about its base, as was described above. A rough count of a small sample in Section K5 indicates that as many as 20 per cent of the trees appear to be barren because of soil deficiencies.

Three scales (Furcaspis oceanicus Ldgr., Lepidosaphes duponti Green, and Aspidiotus destructor Sign.) have been identified by Oakley on the coconut trees on Ponape. These appear to be widely distributed but not important. More damage is done by the coconut hispine beetle (identified by Oakley as Brontispa sp.), which attacks only the new fronds or crowns ("cabbages"), causing those heavily infested to turn brown. Oakley also found less than 10 per cent of coconut leaves infested by the larvae of a moth which "seemed to be present on just about every palm examined." The larvae of the coconut leaf moth "characteristically tie leaves together and feed between them," causing the leaves to die. (See Oakley's report, vol. 14-II.)

Ponapeans seem to regard all these ailments as the result of a single insect which they describe as a small,

light-colored "worm" (mwãs) that has caused many trees to die or to become barren. They say that this larva attacks the "cabbage" first, that it "wraps itself in a little blanket," and that it leaves "ashes" (i.e., scales) behind it on the trees. They say it hatches into small, light-colored insects which fly to the neighboring trees and lay many eggs, hiding in the parts of the leaves where they are protected from the rain. Both the flying insects and the larvae are said to be very numerous during the period of trade winds, but are rarely seen in the rainy season, though the "ashes" can always be found.

Ponapeans distinguish the effects of insect infestation from those of poor soil by the fact that the new fronds at the top of the infested tree are the first to turn brown and to wilt. Eventually all the leaves of a severely infested tree turn brown and hang down along the trunk of the tree, which looks "like it had been burned by fire." In one or two Sections as many as 75 per cent of the trees are said to have been destroyed in this way. When the Ponapeans asked the Japanese for a remedy, they were advised to cut and burn the infested trees. This they did; Chief A6 of Matãlanim, for example, cut and burned about 50 trees out of his holding of 800. Informants say that the disease was introduced in 1936, and that they were told by the Japanese that it had come from Saipan.

The export of copra from Ponape goes back to the pre-Spanish period. It was not until the German period however, that foundations were laid for the establishment of the copra industry on its present scale, with the result that there has been a steady increase in exports since 1920. The German administration recognized copra as the basis of the Ponapena commercial economy and took steps to insure that each family would be able to produce enough to earn the money necessary to purchase the imported goods they required. When private titles to land were issued by the German government, each native receiving title to his farmstead was required to plant one hundred coconut trees. If his farmstead was not large enough for that many trees in addition to his subsistence crops, its boundaries were enlarged until he had adequate land, and provisions were made to see that the farmsteads were not subdivided.

Three inspectors were appointed to visit each Section and see that the holdings were adequate in size and that the required coconut trees were planted. Jail sentences were held out as a threat for failure to obey, though no Ponapeans were convicted. In fact Ponapeans quickly saw the economic advantage of the German program and were eager to comply. Many men planted more than the required number, some as many as several hundred trees at this time. While this program was unquestionably to the economic advantage of German business, insuring both larger exports and larger imports, it was equally to the economic advantage of the Ponapeans, who regard it as a real and lasting benefit for which they still readily express their gratitude to the Germans. The copra industry grew further under the continued encouragement of the Japanese, who offered subsidies after 1922 for planting new trees (20 yen per hectare), thinning old trees or clearing weeds (10 yen per hectare), and for the erection of drying sheds (25 per cent of the cost).

As a result of the German policy each farmstead today, except those which the Japanese permitted to be divided up among the heirs of the owner, has 100 mature coconut trees as a minimum. Most farmsteads have more than the minimum. The median farmstead is estimated by informants to have about 300 or 400 trees.

In July 1946 the chiefs of the five districts made a census of the bearing coconut trees (i.e., excluding immature and barren trees) owned by the members of their districts. Of the 197 individuals covered by the report from Kiti District, 70 per cent reported the number of trees they owned in exact fifties or hundreds. 55 per cent giving the figures as even hundreds; this seems to indicate both a tendency to give approximations rather than exact figures and a pattern of planting trees in groups of hundreds or, less frequently, fifties. The number of trees owned and the number of owners falling into the various classes are listed below; the midpoint of the range can be taken as the average number of trees owned.

TABULATION D

Native Holdings of Bearing Coconut Trees in Kiti District, July 1946

Number of Trees		Number of Persons
Under 25	(1-24)	7
50	(25-74)	27
100	(75-124)	29
150	(125-174)	19
200	(175-224)	39
250	(225-274)	12
300	(275-324)	19
350	(325-374)	3
400	(375-424)	5
450	(425-474)	0
500	(475-524)	18
550	(525-574)	3
600	(575-624)	6
650	(625-674)	0
700	(675-724)	3
750	(725-774)	0
800	(775-824)	0
850	(825-874)	0
900	(875-924)	0
1000	and more	4

Of the four individuals in Kiti District with 1000 trees or more, Frederico and Kosmas of Section K15 own 1000 and 1500 trees respectively; Andreas of Section K30 owns 4000 trees located in Ũ District; and Oliver Nãnipẽi of Section K19 is listed as owning 60,500 trees. In further discussions, Mr. Nãnipẽi gave the total number of bearing trees owned by his company as 87,710 distributed as follows: 30,000 in Section K19, 5,000 in Section K17, 5,000 in Section K21, 5,000 in Section K31, 2,000 in Section K7, and 2,000 in Saptaka, all in Kiti District; 30,500 on Ant atoll; 5,000 in Sections M24 and M25 of Matãlanim District; 3,000 in Kipar in Ũ District; and 200 on Parẹm Island and 10 in Sountin, both in Nẹt District. In addition there were about 60,500 young trees which had not yet begun to bear, of which 50,000 are in Rõnkiti and 10,000 on Ant atoll.

The chiefs' census gives 112,760 bearing trees as the total number owned by members of Kiti District. Excluding Oliver Nãnipẽi, who is the wealthiest Ponapean and largest coconut producer on the island, the average number of trees owned by those reporting is 270. Two hundred and seventy trees was also the average

holding in Nęt District before the war. The largest single class for Kiti is that of individuals who own 200 coconut trees each. The large number of individuals owning less than 100 trees indicates the extent to which farmsteads were divided among the owners' heirs under the Japanese. Since some of the larger holdings (100-250) may also represent shares of what were formerly single farmsteads, it is possible that the median number of trees per original farmstead may still be as high as 300 or 400.

The totals for Ponape as given in the census prepared by the chiefs are given below.

TABULATION E

Census of Bearing Coconut Trees
on Ponape, July 1946

District of Owner	Number of Trees
Kiti	112,760
Matălanim	34,335
Ü	36,651
Nęt	21,260
Sokǫs	34,861
Total	239,867

These figures cannot be taken as they stand without comment. The figure for Kiti District should be increased by 27,200 to include all of Oliver Nănipĕi's holdings. The offshore atoll of Ant is included, but not that of Pakin which was owned by Nambo, nor is their other large plantation in Matălanim District. The number of bearing trees on these two plantations is not known, but is expected to run into the neighborhood of 85,000. An estimated 2,500 trees of the Catholic Mission and the 1,300 trees of the Protestant Mission in Matălanim District are also not included, and there may be other discrepancies. Including Ant and Pakin, the total number of bearing coconut trees can be taken as about 350,000.

Ponapeans report that during the war more than 40,000 bearing trees were destroyed by the Japanese, who used the trunks to support underground air raid shelters and for other military purposes and who killed some trees to eat the palm "cabbage." Of all the districts, Nęt suffered most heavily because of its proximity to the Colony and the military installations about the harbor. Nęt lost more than one third (12,500) of the bearing trees it had had before the war, not including the Etscheit Plantation which was practically wiped out; in the Second Sub-District more than 70 per cent of the trees were destroyed. In Kiti District 10,000 trees belonging to Oliver Nănipĕi were destroyed, the greatest destruction being in Section K19 and on Ant atoll. There were 4,750 trees owned by people of Matălanim and more than 7,000 trees owned by people of Ü which were destroyed. The total losses of the people of Sokǫs were not recorded in the census, but the four sections reporting on this point claimed the destruction of more than 6,000 trees. The Japanese said they would pay two yen for each tree they cut down but did not keep their promise. Generally the trees were cut without asking the owner's permission.

A number of trees in the immediate vicinity of the Colony were also destroyed by American air raids. The exact number of these is not known, nor is it certain they have not been included in the figures given above. Not included in these figures are the trees that ceased to bear during the war because of neglect or disease. Although a large number of trees that formerly produced copra have been lost, young trees have also matured during the war. As a result it is impossible to calculate potential production at present by subtracting the copra produced by trees that have been destroyed from prewar exports.

Local copra buyers and producers counted on the average tree to produce 50 nuts per year, or about one nut per week; and it is estimated that about 5,000 coconuts are required to produce a ton of copra. In other words 100 trees yield about a ton of copra each year, and the annual porduction per hectare is 1.2 tons. According to these figures and the estimate of bearing trees on Ponape, Ant, and Pakin, the potential production of copra at present should be in the neighborhood of 3,500 tons per year. Taking into account the coconuts that are consumed locally and the waste and spoilage before shipment this is not too far out of line with estimates of prewar exports to be unreasonable (see p. 96).

Copra manufacture involves clearing the weeds and vines, gathering and husking the nuts, and cutting out and drying the meat. These functions as well as planting and the other tasks associated with coconut cultivation are properly men's work, but this pattern was considerably modified during the period of forced labor. Before the war copra was made throughout the year. Each section of land planted in coconuts was cleared three or sometimes four times annually. This meant that on the larger holdings copra manufacture went on almost continuously. Coconuts can lie on the ground for two or three months without being completely lost for copra purposes. The part of the flesh (pär) which has become crisp and watery must be cut out, but the Ponapeans gather and use nuts when the sprouts are not more than two feet tall, for small nuts, or three feet, for larger nuts.

The practice of making copra several times a year was introduced by the Germans. The earlier pattern had been to clear the land only once a year, about December, so that copra could be made during the trade winds when it is easier to dry. Less work was involved since drying sheds were not necessary, but undoubtedly there was a smaller yield per tree. Roughly two-thirds of the crop must have been lost through sprouting, if the nuts consumed locally are not counted. The yield of the trees may also have been affected by the vines, which grew clear into the treetops between cleanings. The new pattern made the work of cleaning the ground easier, if more frequent, since the vines did not have to be pulled out of the treetops and weeds and hibiscus were smaller and easier to cut. The season of the trade winds is still the best for making copra.

Clearing the ground, which is done with the knife, is an essential part of gathering the nuts, which may be hidden in the grass and weeds. Weeds are cut down to a height of about six inches in a circle around each tree within which coconuts may lie. The larger hibiscus trees are also cut in between and if necessary vines are pulled down from the trees. One or two of the ripest nuts may be picked from the tree. The nuts are gathered and husked at a convenient spot under the trees, using the coconut husker. A great deal of proficiency is shown in husking coconuts. Although it is difficult work some people can handle 300 nuts in two hours or less. As many as 500 nuts may be husked

in one spot, after which they are carried to the drying shed in a special form of copra basket (kęlęk ęn mwängas) made of coconut leaves. Two copra baskets, each holding 25 or 30 husked coconuts, are hung on a carrying pole, with one at each end. Sixty nuts are about as much as a man can carry. The husks are left under the trees. On the larger plantations the nuts may be carried a mile or more, but on ordinary farmsteads the distances are short.

At the drying shed the nuts are cut open and the meat is removed with a knife. The juice of the ripe coconuts may be fed to pigs in a wooden trough and some may be kept and boiled for drinking. The crisp, watery portion (păr) is cut out and fed to the pigs or eaten if the worker is hungry. The shells are saved for fuel. Although the meat becomes loose by itself if allowed to stand for a few days, it develops red spots that turn black after drying and lower the quality. In recent times people have cut the meat into small pieces an inch or two long and from a half inch to an inch wide or smaller so that it will dry better.

High humidity, heavy rainfall, and almost constant cloudiness make drying copra a real problem on Ponape at all times of year. In the early days of the copra trade, the meat was laid out in the sun and taken into the house whenever it rained, but later drying sheds were introduced. In the Japanese period every household was required to erect its own drying shed under threat of arrest. This regulation, like the German one concerning copra, was regarded as a good idea nad everyone willingly built sheds, some families erecting two or three.

Two types of copra sheds are used, one using wind drying and the other fire drying. The former is successful only on the windward side of the island, and is used mainly in Ũ and Matălanim districts, though it could probably work in parts of Nęt and Sokŏs. Sheds using wind drying work best during the season of the trade winds, which blow steadily from the northeast and east; with the aid of the winds drying takes about four days. In most parts of Ponape and particularly in Kiti District, the largest producing area, wind drying has been found unsatisfactory and fire drying is necessary. A large fire of coconut shells is built in the shed in the evening and allowed to burn two or three hours, during which time there is considerable smoke. Afterward the fire is spread around the floor, leaving a hot bed of coals that gives off little smoke. The trays of copra are then put into the shed and left overnight. In the morning they are taken out and laid in the sun if the weather permits. Drying takes three nights and three full days of sun, and longer if the days are rainy or the skies overcast, as they usually are.

Fire drying turns the copra brown in color, producing what is known as "black" or "dark" copra (mwängas tontol) whereas with wind drying a higher grade of "white" or "light" copra (mwängas pwętępwęt) is produced. Until about 1936 the Japanese paid higher prices for the latter, but afterward price differentials were abandoned. With fire drying, color can be used as an indication that the copra is fully dried, but with wind drying the pieces have to be broken to test them.

Rats, which can eat a whole bag of copra in a night, are probably the worst copra pest, particularly on Ant Island where they are most numerous. On Ant Island the Nănipĕis hunted rats at night with trained dogs. They say they often killed fifty or sixty rats, and have killed as many as four hundred or five hundred in a single night. The Nănipĕi Company had about seven dogs for this purpose, in addition to trained dogs owned by some of their laborers. The dogs also are trained to smell and dig out rats in their holes, but the greatest numbers were killed in the warehouse at night. Rats are much less of a problem on Ponape itself and can usually be controlled by traps. During the war it was sometimes necessary to use native-made bamboo rat traps, but before the war imported traps were used almost exclusively. Either a piece of pit breadfruit (măr) or burned copra is regarded as the best bait. A piece of copra is put into the fire until it is scorched, so that rats can smell it for a long distance.

Copra molds easily on Ponape, often within as little as a week after drying. Mold (kitäi) can be removed by laying the copra out in the sun. It does not affect the center of the copra and did not influence its market price. Copra was packed in bags holding 50 kilos, more or less, and was stored in a corner of the house after drying. It was sunned by the producer before it was delivered to the trader, and again before being loaded onto the ship.

Copra which has been poorly dried is attacked by a small white "worm" (mwäs), which is brown at both ends and is recognized by Ponapeans as different from the insect that attacks the coconut palm. According to Oakley it is probably the larva of the copra beetle (Necrobia rufipes DeGeer). Starting in the brown or black spots, which have been only partially dried, the larva eats into the white center of the "dark copra," eventually leaving only the brown outer surface and then going on to thoroughly dried pieces in the same bag. The progress of the insect is slow, however, and can be controlled by separating the poorly dried pieces as soon as the spots appear, a few days after drying, and drying them further in the sheds. Poorly dried and wormy copra brought about half price under the Japanese. Only three grades of copra were recognized. Good copra brought 12 sen a kilo to native producers; "damaged copra" which was wormy and spotted brought 6 sen a kilo; rejected copra, which was not allowed to be exported, was generally sold to Carlos Etscheit for soap manufacture at 4 sen a kilo.

Before the Seisan Kumiai was established, copra was purchased through private trading stores in the outlying districts owned by the Japanese, by the Nănipĕi Company, and by the Etscheits. The traders resold the copra to exporters for 14 sen a kilo for first grade and 8 sen a kilo for second grade delivered in the Colony, unless they exported it themselves. This allowed a margin of 2 sen a kilo or 20 yen ($5.00) per metric ton for both grades to cover spoilage, bagging for shipment, freight to the Colony, and inspection and grading. The cost of the bags was about 10 yen ($2.50) a ton. New bags of good quality holding about 50 kilo (40-60) kilo and weighing 1.5 kilo each were sold to producers for 50 sen (12.5 cents) each. Each producer owned the bags in which copra was brought to the store, but they were returned to him for further use after the copra had been purchased. Copra was exported in new bags furnished by the exporter. A lighterage fee of 2.50 yen (62.5 cents) per metric ton was imposed for transporting copra from the piers to ships at anchor in the harbor.

In the outlying districts the traders acted as government copra inspectors. Copra was examined again in the Colony by government inspectors who sealed bags that had been approved. Violation of the copra inspection regulations established in 1932 was punishable by

a fine of 100 yen. In 1933 an ordinance was put into effect which provided for the inspection of all plants and seeds, under penalty of a 200 yen fine, in order to prevent the spread of injurious insects and micro-organisms.

When the Seisan Kumiai took over all copra buying in the outlying districts, the store managers continued to act as copra inspectors and the prices to the producer remained the same. All bookkeeping was done in the Colony and the price credited for copra delivered to the Colony by the stores was not announced. A Seisan Kumiai store manager estimated that it was 20 sen a kilo for the first grade, which would have given a margin of 80 yen ($20.00) per ton.

Accurate figures on the production and export of copra for the Ponape Branch Bureau are difficult to obtain, since Japanese trade statistics were generally published only for the mandated area as a whole. No figures at all have been found which show production for individual islands within the Bureau. The value of Bureau copra exports for the years available is shown above (page 87). Of the 784,478 yen worth of copra exported from the Bureau in 1937, 121,578 yen was shipped from Kusaie while 662,900 yen was shipped from ports on Ponape. Exports from the Bureau averaged 850 tons annually between 1900 and 1910, and rose to 2,775 metric tons in 1936 and 2,561 metric tons in 1940. The value of copra exports in 1937 was 80 per cent greater than in 1936, but from 1936 on, and possibly even a few years earlier, copra production was being affected by the Japanese program of forced native labor. Estimates of normal prewar exports from the Ponape Branch Bureau made today by copra traders on Ponape, both Ponapean and European, run from 3,000 to 6,000 metric tons a year. The former figure is most commonly given, and the latter, which is completely out of line with available statistics, is best disregarded.

The general trend has been a rapid expansion of copra production, with exports being more than tripled in less than thirty years as a result of German and Japanese policies. From year to year, however, there was considerable variation depending upon the price of copra in the world market. When income from copra was low and less imported food could be purchased, more time was devoted to subsistence foods and, particularly on the neighboring atolls, more coconuts were consumed as food and drink. When copra prices were high, more rice, wheat, and other imported foods were purchased and a larger part of the crop was exported as copra. Production also varied with the availability of wage labor. It was more constant on Ant Island where contract laborers were recruited from the Mortlock Islanders than in districts like Matãlanim where casual laborers were relied upon.

In the absence of any figures whatsoever, the following estimates of annual exports within the Bureau must be regarded as wholly tentative.

The Japanese commercial interests are said to have protested that the copra export trade was suffering as more and more Ponapeans were drawn into forced labor in the late 'thirties, but they were unable to alter the trend. By the spring of 1943, when copra exports were stopped entirely by the American submarine warfare, copra production is said to have dwindled to a negligible amount. Some coconuts were harvested during the war for local consumption and coconut oil for local use was being manufactured, but most of the coconut trees on both native farmsteads and Japanese plantations were neglected and were rapidly overgrown.

TABULATION F

Tentative Estimate of Prewar Copra Exports

Ponape Island	(Metric tons)
Kiti District	600
Matãlanim District	400
Ũ District	200
Nęt District	150
Sokȫs District	150
Total	1,500
Nearby Atolls	
Ant	400
Pakin	200
Total	600
Eastern Run	
Eniwetok	?
Mokil	100
Pingelap	150
Kusaie	300
Total	550
Western Run	
Oroluk	?
Ngatik	150
Nukuoro	100
Kapingamarangi	100
Total	350
Total	3,000 (per yr.)

Before the copra industry can be re-established at its prewar level, the plantings must be cleared of vines and weeds, which in four to six years of neglect have grown large. Nearly all the copra-drying sheds must be rebuilt. Both tasks require a great deal of labor and were subsidized under the Japanese. Although the Ponapeans returned eagerly to their farmsteads when the Japanese surrendered, they did not at once resume the production of copra. During the first year of American occupation no copra was purchased either on Ponape or on the other islands of the Ponape Branch Bureau. This delay is in part due to an understandable reaction against forced labor under the Japanese and a desire to enjoy feasting and relaxation, which they were denied during the war, but this factor should not be exaggerated, as it is in a Military Government report of January 1946:

> The natives which had been forced to work by the Japanese have readily accepted their new "freedom" and refuse to work on the large coconut plantations. Each native has dreams of being his own king and the plantations which now have a beautiful supply of nuts lie dormant.
>
> During the past four years the plantations, for the most part, were not cleared of the heavy underbrush. The clearing of plantations will require long and arduous labor—to which work the native is pathetic [sic]. Until this brush is cleared away the plantations will produce little copra for the nuts cannot be readily found with the facility necessary for commercial success.

A number of other more important factors are involved, such as the necessity of producing subsistence goods. At the end of the war there was a marked shortage of native houses and canoes because there had been no opportunity to replace those that had worn out or been destroyed. In the districts where Japanese building materials were distributed, new houses were being built and old houses being repaired on all sides during the summer of 1946. In all parts of the island new canoes were appearing every week. Canoe houses, fish nets, furniture, pots and dishes, and other items that had worn out, been destroyed, or been hidden away during the war had to be replaced or gathered together. First and foremost, food had to be produced. Since only meager amounts of rice, flour, and other foodstuffs were being imported, the manufacture of copra had to wait until subsistence needs had been satisfied.

A part of the delay in the return to copra production was also due to doubts about the American policy on copra buying. The people of Ponape were not certain that they would actually be able to continue to sell copra under the new regime. Since copra has been their basic source of cash income, and since they have depended on copra sales for the purchase of clothing, metal goods, and other imported items, this uncertainty gave them a great deal of concern. The subject came up repeatedly at feasts and smaller gatherings; other possible sources of income were discussed one by one, and rejected hopelessly as inadequate.

This uncertainty was not without reason in spite of numerous assurances that copra would be purchased. For a large part of the first year of occupation no provision for the purchase of copra was made. At first no trading companies existed. When, in January, U. S. Navy officials told the Ponapeans to clear their farmsteads and produce copra, they could not answer the question "Who is the man that is going to buy it?" When the U.S.C.C. representative visited Ponape in February with a shipment of trade goods, he did not stay long enough to purchase copra. Furthermore, the Ponapeans did not understand whether the price he quoted was per pound or per kilo, the latter being regarded as too low to make production worth bothering about. When a U.S.C.C. man was assigned to Ponape in May, he had no instructions on copra and had not even been informed what price he was authorized to offer. When the price of $40.00 per long ton was announced during the summer, the value per coconut (about 0.8 cents each) was about one fourth the price fixed by Military Government for drinking coconuts (3 cents each), and these require no husking, no cutting, and no drying. The prices established by Military Government for freight on copra to the Colony were 200 per cent of that formerly charged by private Japanese companies and 666 per cent of that later charged by Seisan Kumiai, whereas the price of copra was only 133 per cent of that paid by the Japanese traders in the outlying districts. And when the district stores were established for the distribution of U.S.C.C. trade goods, they were not authorized to buy copra.

Throughout most of the first year the Ponapeans had to wait to see who would buy copra and what the price would be. Meanwhile no warehouses for storing copra and no evidence of any real provision for shipping copra exports were to be seen, and no copra knives could be bought. Most Ponapeans were waiting to see whether they would actually be able to sell copra before they began to produce it.

Forty tons of copra had been waiting purchase on Mokil since the spring of 1946, but no shipping was available to collect it. Several tons were offered for sale in June, but had not been purchased two months later. These were produced by Oliver Nānipēi in spite of the difficulties of trying to finance laborers on his large plantation after having had to surrender his yen and accept in exchange the $50.00 which was set as the maximum to be given in return. It was because he could not pay their wages that some of his laborers refused to work "on the large coconut plantations," as mentioned in the Military Government report quoted above.

All these factors are far more important in explaining the Ponapeans' slowness in returning to copra production than are any dreams that each might become "his own king." A few copra drying sheds were erected on Ponape but many individuals were postponing work on copra until the trade-wind season, when clearing farms and drying copra is easier. With copra knives and trade goods available in the district stores, with the exhaustion of the dollars received in return for yen, with an authoritative announcement of prices, and with provision for warehousing and shipping copra once it has been purchased, it is expected that December could see the beginning of the return to copra manufacture. As copra is actually purchased and shipped, and as the district stores are authorized to accept and pay for copra deliveries, conversion should rapidly pick up speed, provided that the prices offered prove reasonable in terms of those charged for imported goods.

Although it is expected that copra production will be resumed during 1947, exports will almost certainly be below the prewar level for the first year or two. Eniwetok is said to be wiped out as a source of copra, and the labor situation on Oroluk is not known. Whether or not the Japanese plantations on Pakin and in Matālanim will contribute depends on when and how they are disposed of. Mokil is said to be fully planted with coconuts and for other atolls maximum production is in sight, but there is still room for expansion on Ponape. In fact within the next five or ten years it is possible that prewar exports could be exceeded. Oliver Nānipēi alone has more immature trees than the number of trees destroyed on the whole island during the war, though neither the number of trees that have been lost through disease nor those that have reached maturity during the war is known.

In addition to the small holdings of coconut trees on the native farmsteads and the large holdings of the Nānipēi family, there were two large Japanese copra plantations operated by Nambo. One was on Pakin Island and the other in Matālanim District at Pōnlangas, which lies inland behind Section M19. The Pōnlangas plantation was originally a 1000 hectare plot leased to the Jaluit Company at the close of the German period, for 99 years with renewal privileges. The area leased to the Jaluit Company lay on a level area in the foothills above and behind the belt of farmsteads along the shore, toward the southern part of Matālanim harbor. It was land that was not being used, and in marking out the property a strip of land was left between it and the native farmsteads for native mountain farms and expansion of the farmsteads.

In 1930 Nambo began planting coconut trees in this area. Planting was started at the southern end, working north with new trees being added each year. Although the full area marked out by the Germans was never planted, the land leased by Nambo is said to have been expanded in later years both toward the shore, so that

the land left for native expansion and mountain farms was absorbed, and toward the north to hold unoccupied land which might otherwise have been claimed by the large and growing Kohatsu Plantation. In addition, rights to some Ponapean farmsteads were acquired for a small wharf and a road from it to the plantation.

An estimated 600 hectares or about 72,000 trees were planted before planting was abandoned at the beginning of the war. The area in which the plantation is situated, and from the plantation to Section M24, is said to be one of the most fruitful parts of Ponape for growing coconuts. During the war most of the plantation was neglected. Only 1000 or so of the oldest trees were harvested for the production of coconut oil. The rest of the plantation became heavily overgrown with vines and weeds. A number of the mature trees were not bearing. The number of trees that were still immature is not known. Actual copra production was small before operations were interrupted by the war. In one year from 3 to 4 tons were actually exported, but this was expected to increase in another year or two to from 20 to 30 tons.

Both Nambo copra plantations present something of a problem as to their final disposition. It is assumed that both can be proved to be property of the Japanese government and as such become property of the United States. Both represent heavy economic investments on the part of the Japanese government, through subsidies, and of Nambo itself. Both are potential sources of income. What is actually done with these plantations, particularly the one in Matālanim, will materially affect the welfare of the Ponapeans, either for the better or for the worse. It is urged that, in making the final disposition, Ponapean welfare be placed above considerations of either past investment or future income.

Coconut oil was expressed commercially on Ponape for both cooking purposes and the manufacture of soap. The Japanese had a number of hand operated screw presses which used undried, grated copra. Grating was done mechanically on simple, locally made, lathe-like machines which were generally motor driven. The split nuts were held against rapidly turning iron spheres which had been roughened with cutlike dents in their surface. Several such solid iron balls were set on a single belt-driven axle so that three or four laborers could work side by side. In one plant in Kiti District, where making coconut oil was combined with making coir rope from the husks, the machinery was driven by a water wheel with a small steam engine serving as an auxiliary. In a test of this press made and recorded by a Ponapean, 100 husked nuts yielded about two-thirds of a gallon (2-2/3 liters) of oil. The husked nuts weighed 44 kilos, of which about 5 kilos was water, 18 kilos shell, and 22 kilos hand-scraped meat. The 22 kilos of fresh grated coconut when pressed gave 15 kilos of cake and six kilos of coconut milk or cream, which reduced to four liters weighing four kilos after boiling. In other words, the grated coconut meat yielded 18 per cent boiled oil by weight, 68 per cent cake and 14 per cent water and waste. Some of the abandoned Japanese hand presses were operated by Ponapeans to produce coconut oil, which sold locally at the price of 25 cents a bottle (2/3 liters) set by Military Government.

The first modern-type oil press on Ponape was a hydraulic model owned by Carlos Etscheit. He says it yielded 45 per cent oil and 55 per cent cake by weight. It was used to produce oil for soap manufacture, largely from copra which had been rejected for export. When he was interned, his equipment was leased to one of the Japanese companies who took up the manufacture of soap where he left off, and later imported an additional press from Japan to supply the local needs of the island during the war. Mr. Etscheit was assembling what he could find of his equipment in order to resume soap manufacture. When his mill was completed, he expected to produce 300,000 cakes of soap a month, each weighing 200 grams and selling at 5 cents each. Meanwhile he had made some soap from hand-pressed oil. His soap lathers in salt water and is well known and well liked by Ponapeans.

Because of the difficulties of drying copra on Ponape and the lower price that smoke-dried copra will bring in the world market, the possibility of producing and exporting the higher priced oil and cake should be given full consideration. One possibility that suggests itself is the use of a number of mechanical graters and hand-operated screw presses of the Japanese type located in convenient places around the island. From these both oil and cake could be shipped for further treatment to a small but modern oil mill located in the Colony. This would eliminate the difficult process of drying by permitting the use of fresh copra, and would avoid the problem of shipping the nuts to the main press. A surplus copra press at Guam was requested for Ponape by the local U.S.C.C. representative. The press in question had a capacity of from 1,400 to 1,800 tons a year working one ten-hour shift daily. This could be increased to from 2,800 to 3,600 tons by working a double shift, so that the entire production of the Bureau could be handled on Ponape.

With a modern oil press and with a small modern soap factory, Ponape could supply soap not only for the Eastern Carolines but also for a large part of the mandated territory. This sort of economic enterprise for Ponape recommends itself for several reasons. The central oil mill and soap factory need not require a large number of laborers; supplies of soap for Micronesia are likely to be difficult to obtain during the next few years; the difficulties and waste of drying copra on Ponape could be eliminated without interfering with copra production on the atolls where drying is easier; the cost of shipping copra to and soap from the United States or alternative places of manufacture could be eliminated; and a reliable market would be provided for the major cash crop of Ponape and the neighboring islands.

2. Breadfruit (māi).—Breadfruit provides three forms of food. Fresh breadfruit, with yams, is one of the two primary food plants in the subsistence economy. Two varieties of breadfruit (māi pā or māi mat and māi kōlę) have seeds that may be used as a starch food substitute of minor importance in the subsistence economy. The third form, pit breadfruit, important in the prestige economy, is used for subsistence purposes as a substitute for fresh breadfruit and yams and is a reserve against times of typhoons and possible famines. Neither breadfruit nor yams had any real commercial importance. A few fresh breadfruit were sold to the local Japanese community for food, and Nantaku through its subsidiary Nanyo Ori canned breadfruit for export on an experimental basis. Japanese reports show that the 1937 production was 4,303.6 tons of breadfruit valued at about 259,000 yen and that 420 hectares had been planted to breadfruit in the Ponape Branch Bureau. Most of this presumably was on Ponape and Kusaie.

The names of seventy-eight native varieties of breadfruit were recorded, all of which, except those with seeds, are believed to be Artocarpus altilis. All varie-

ties are said to date from the native period. Jakfruit is found only on the Experimental Station. The varieties are differentiated mainly by their leaves, but in some the fruit or the tree itself has distinctive characteristics. All breadfruit varieties are classified by the Ponapeans into two types: (I) mäinuę and (II) mäin säręk. Most varieties, including the two with seeds, fall into the latter group. Mäinuę and mäin säręk seem to be strictly class names and not to refer to specific varieties, but informants were by no means certain on this point.

The fruit of type (I) has a smoother skin and a more spherical shape, whereas that of type (II) is more pimply and elongated. Type (I) is regarded as having a better flavor and is preferred to type (II) and the variety (mäi kalak) which is liked best of all is of type (I). The varieties of type (I) are also earlier in maturing, whereas most of the varieties eaten late in the season are of type (II). The following list, which has not actually been verified, is given tentatively as an indication of the periods in which some of the more important varieties mature.

May and June: mäi ŭp (type I); mäi kalak (I); mäi pä (II)

July: mäi arapa (I); mäi tǫl (II); mäi kuęt (I); mäi ti (II); pompop (II); mę̆mtǫl (II).

August: mäi li (II); mäin kǫtakot (II); mäi pwilięt (II); mäi kiǫl (II); mäi täith (I); mäin patäk (II); lę̆tąmp (II); mäi są (II); mäi wǫkǫ (II); mäi pwęt (II); mäin pŭt (II); mäi kŏlę (II); mäin pŏnsakar (II); mäin sęrisąng (II).

September: lipęt (II); mäi kątięu (II); nänumwäl (II); mäin usar (II).

October and November: lŏki (II); lŏkiamwas (II); lŏkięlęl (II); lŏkiępwęt (II); lŭkual (II).

The first three varieties can first be picked in early May, in the order listed. In this month very few breadfruit mature and it is not until June that they can be eaten in any quantity. The early period, when the first few ripe breadfruit are to be found, is known as "under the eye of the breadfruit harvest" (pänmasęrak). The early part of the breadfruit harvest (räk) can be equated tentatively with July, the middle with August, and the late part with September. Several varieties, which are classed together as a subtype of type (II) and are referred to collectively as lŏki or lŭkual, come after the real harvest season is considered to be over. As indicated earlier, there is considerable variation in breadfruit seasons from one part of the island to another.

During the middle period a great number of varieties mature at the same time, and many families cannot consume all their breadfruit, much of which rots on the ground. Breadfruit is more plentiful and more important in Kiti and Matälanim districts on the leeward side of the island than it is in the north, particularly in Nęt District.

It is said that all trees of type (I) on Ponape have been planted, whereas there are many of type (II) growing wild in the mountains. Of the varieties of type (II) only mäi pä or mäi mat, which grows wild on the small islands of Ponape's outer reef, does not grow wild on the main island; a few, however, have been planted. Many of the better varieties of type (II) are brought home and planted. Some people plant no trees of type (II) but gather all their breadfruit of this type wild; others gather no wild breadfruit, using only trees that they have planted for both types. Most of the breadfruit of type (II) eaten on Ponape is gathered from wild trees; but if breadfruit of type (I) is also included, the greatest part of the breadfruit eaten on Ponape is cultivated. Wild breadfruit is used primarily to fill in after the trees on the farmstead have stopped bearing, in the same way that Alocasia, "Western yams," cooking bananas, and other starch food substitutes are used.

A good farmer tries to have early, middle, and late varieties of breadfruit on his farmstead so that he will have fresh breadfruit at hand throughout the season. One informant had purchased a farmstead about fifteen years before on which there were about fifty trees of five varieties, maturing early (pompop), middle (mäi kiǫl), late (lipęt, nänumwäl) and after the end of räk (lŏki). To these he added fifty more trees of three varieties (mäi ŭp, mäi kalak, mäi arapa), all of which mature very early in the season, so that he would not have to use substitutes so often in May and June when there were no more yams.

Breadfruit is planted by men, usually at the beginning of the rainy season. It sprouts in a month or two and grows quickly, bearing fruit within two to six years depending on the soil and the location. Chief A9 of Kiti had bearing trees that he said were planted only a year before. With good soil a breadfruit tree may continue to bear for a man's lifetime, giving him adequate security in his right to the land under the Ponapean system of land tenure as well as a continuing source of food. Breadfruit is planted only on the farmstead, never in the mountain farms.

In planting breadfruit, a rhizome or "sprout" (ĭl, ĭl ęn mäi) from a root running out from the tree along the ground is used; the rhizome is sometimes less exactly referred to as a "root" (kalo, kalo ęn mäi). The Ponapeans say that breadfruit is different from other trees in that cuttings from its branches will not take root and cannot be used in planting. A rhizome about two inches in diameter without branches is selected. The root from which it grows is cut in two places, a few inches on each side of the rhizome. The rhizome is trimmed off at the top to a length of four feet, and it is expected that the top two feet will die before it begins to grow.

Breadfruit is planted in a hole one foot deep dug with a man's digging stick. The rhizome is inserted down to the bottom of the hole, which is then refilled with dirt, and it is tied with hibiscus bark to a tripod of hibiscus sticks for support. When the new tree has reached a height of six feet, a vertical slit in the bark is made down one side with a knife so that it will grow more quickly. A few months later the top, where the new leaves are appearing, is cut off to make it branch out; if this is not done the tree grows very tall and has few branches. These are all old patterns which have not been influenced by contact. To increase the fertility of a breadfruit tree an iron rod may be driven into its trunk.

Breadfruit trees have to be protected from cows, which are tethered out of reach. Cows sometimes eat up a young tree or kill an old one by eating the leaves, small branches, and bark. Pigs and chickens do not bother breadfruit, but occasional damage is caused by wild deer. The fruit of the trees is often spoiled by pigeons (muroi), bats (pwęak), parakeets (sęrę), and a black bird (sĭǫk), but breadfruit is so plentiful in season that no one bothers about them. Young breadfruit trees

are sometimes killed by snails, and the "worm" which attacks coconuts has also attacked and killed some breadfruit trees. A small reddish fly eats ripe breadfruit, boring into the flesh.

When breadfruit is harvested, it is pulled from the tree and lowered to the ground with the breadfruit picker so that it is not bruised. When it is necessary for a man to climb high into the tree, as he usually must, he carries the breadfruit picker with him. He pulls the fruit in and then drops it onto a previously prepared bed of grass some nine to twelve inches thick. Breadfruit that is bruised by being dropped directly on the ground spoils before it can be used. Harvesting, like planting, is men's work, but women occasionally gather breadfruit that can be reached from the ground with a breadfruit picker. One variety of breadfruit is named "women's breadfruit" (mäi li) because its branches are close enough to the ground for women to climb and pick its fruit. Breadfruit is carried home from the farm or the mountains by hand, in the farm basket (kęlęk) or on a carrying pole. If the trees are less than half a mile from the house, a carrying pole is used. In gathering the large quantities that are required for pit breadfruit, the farm basket is usually used.

Fresh breadfruit (mäi) is most often eaten after being baked in the hot stone oven (üm) by men. It may also be boiled or fried, by women, and if it is left over from the previous day it may be warmed up in the "ashes" by women. In baking, the breadfruit is usually halved or quartered and wrapped in large leaves. Cooked breadfruit is mäi lęu; raw breadfruit is mäi amas. One of the varieties with seeds (mäi pä or mäi mat) can be eaten raw, but it is little liked for ordinary use because it has so little flesh. It takes its second name, "ripe breadfruit" (mäi mat), from the fact that it ripens quicker after picking than any other variety.

The flavor of the breadfruit depends on both the manner in which it is cooked and its degree of ripeness. The Ponapeans distinguish five stages in the growth of breadfruit: (a) the bud (pępę), which is light green in color and long and slender, about an inch in diameter and six to eight inches in length, and which is not to be confused with the rolled-up candlelike leaf sheaths of about the same color and size that are frequently seen in the branches wrapped around new leaves; (b) immature breadfruit (mäi pul), which is still small and not old enough to eat; (c) mature breadfruit, which is ready for eating but spoken of as not "ripe" (mäi ñkąl); (d) "ripe" breadfruit (mäi mat or mäi kol), which is soft and fruity in flavor; (e) (mäi matąnai) breadfruit which is overripe or rotten and no longer edible. Both stages (c) and (d) are edible (mäi ma) and are baked in the oven. The latter has a very marked fruity flavor, and is so soft that it is usually eaten with a spoon; the former has less flavor and is firm enough to be eaten readily with the fingers. Breadfruit of stage (d) can be either tree-ripened or artificially ripened. Most commonly it is picked in stage (c) and artificially ripened by sticking a sharpened piece of wood into the core (pwuria) and allowing it to stand overnight or for two nights. If breadfruit is to be eaten in stage (c), it must be cooked the same day that it is picked.

Pit breadfruit (mär) is prepared by leaving artificially ripened breadfruit buried in a large pit (kälipw) for several years. Sex taboos (pąlisuęthinli) formerly had to be observed by both men and women in making pit breadfruit or else it would spoil. First the breadfruit is picked and carried home by the men and allowed to stand overnight, after the cores have been pierced. On the following day the women skin it with cowrie-shell peelers, quarter it, and remove the cores. Meanwhile the men dig the pit with digging sticks and line it with banana leaves. The men then fill the pit to the ground level with the prepared breadfruit, cover it with banana leaves, and pile a large number of rocks on top. Old pits abandoned many years before may be used again instead of new ones being dug.

Depending on the size of the pit that is being prepared and the number of men and women who are helping, the work may carry over through the third day. Most pits are said to hold between 3,000 and 10,000 breadfruit, the former giving a mär about four feet deep and six feet in diameter and the latter one about nine feet in diameter and four to five feet deep. For the larger mär clan members assist the family, and formerly section mär of large size were made by all members of the section. Privately owned mär are still made and used. Even the poorest households have two or three and the richer ones have from five to ten.

Pit breadfruit is made from about the middle of July through the end of August. Three varieties of breadfruit are most commonly used (mäi arapa; mäi kuęt; mäin patak). The first two are of type (I) and mature about July in the early part of the season; the third is of type (II) and matures in midseason, about August. Pit breadfruit made from any varieties of type (I) is orange in color and has a cheese-like smell after cooking, though its taste is much less pronounced than cheese. When varieties of type (II) are used the mär is very dark or black in color and has a much stronger smell and flavor when cooked.

Pit breadfruit can be eaten after it has been left in the ground for one week. At this time it still has the flavor of ripe breadfruit, but after a month in the ground it turns sour. Some people like its vinegar-like taste at this stage, but most do not eat it until three or four years later, when the sour taste has disappeared and it has acquired the characteristic cheesy flavor of mature pit breadfruit. Recently the people of Ponape have learned from the Pingelap and Mokil that the sour taste can be removed by putting the mär in a cloth bag and soaking and kneading it in water, but this practice is still not common.

Each year the entire mär must be removed from the pit and rewrapped in fresh leaves. Fresh breadfruit is added to the pit at this time to replace portions consumed during the year, but this does not affect its age for competition purposes. There is apparently no limit to the length of time pit breadfruit will keep and, like cheese, its flavor improves with age. A number of the section mär made at least thirty years before, in the German period, were still in use, and it is said that one man in Kiti District had a pit breadfruit which dated from before the smallpox epidemic in 1853. Breadfruit pits are of course one of the prize possessions inherited by a man's heirs.

A few people make a special kind of pit breadfruit known as "salt-water mär" (mareęęth). For this the breadfruit is artificially ripened, peeled, quartered and cored, and soaked overnight in the lagoon. The breadfruit is placed in the farm basket (kęlęk), which is tied shut with hibiscus bark and weighted down near the shore so that it will not float away. After soaking, the breadfruit is placed directly in the pit; it is not pounded in salt water, nor is it resoaked when it is removed from the pit after aging.

Women do not cook pit breadfruit. It is baked by

men in the oven after it has been kneaded on a flat stone until it is smooth. Often grated coconut is added while it is being kneaded. It is frequently served, like cheese, at the end of a meal, but it is also used as a substitute for fresh breadfruit or yams. Pit breadfruit is the only form in which starchy food is preserved for any length of time, and as such it constitutes an important reserve against times of emergency and hunger.

The two varieties of breadfruit that have edible seeds (kŏlẹ) are măi pa or măi mat, which has twenty or more seeds, and măi kŏlẹ, which has only three or four. Breadfruit seeds are baked in the hot stone oven and are said to taste like Inocarpus or Polynesian chestnut (32). They are well liked by some people but since there are few trees of these two varieties on Ponape, breadfruit seeds are not eaten frequently and are of very minor importance in the diet.

3. Yams (kặp).—Yams, like breadfruit, are one of the two primary food plants in the subsistence economy, but have never had any real commercial importance. In the prestige economy they are more important than breadfruit. Yams are preferred to breadfruit, although they are produced in smaller quantities. Japanese reports show the production of 792.7 tons valued at 55,560 yen on 107 hectares in the Ponape Brnach Bureau in 1937. Most of this was presumably on Ponape.

Some one hundred fifty-six native varieties of yams were recorded, with descriptions as to size, shape, and color and, for most varieties, the period of their introduction. The total number of varieties planted on Ponape probably runs well over two hundred. Because of the number of recognized varieties and the interest in and knowledge of their histories and characteristics, Ponape offers a unique opportunity for a horticultural study of yams, provided that is undertaken by someone who is capable of breaking through the secrecy which surrounds yam farming.

Proper horticultural and botanical identification will have to wait until such a study is made; it was impossible even to make an attempt during the period that the survey party was at Ponape. One native variety (kặpin paniau pwẹtẹpwẹt) was identified by Fosberg as Dioscorea alata, and it is assumed that all may be Dioscorea alata and Dioscorea esculenta. Three varieties of "Western yams" (kặpinăir) were also identified as Dioscorea or true yams by Fosberg, although they are regarded by the Ponapeans as separate and distinct from yams (kặp), which can be more specifically distinguished as "yams of inhabited places" (kặp in nănsap), if there is any possibility of confusion. One of the two varieties of wild yams, which are distinguished by a completely different name (palăi), was also identified by Fosberg as Dioscorea.

That the people of Ponape are able to grow yams of enormous size is not to be doubted. Their reputation has spread at least as far as Truk, where yams are of minor importance. When I asked why they do not use yams to tide them over the lean period between breadfruit seasons as is done on Ponape, Truk informants replied, "But the yams on Ponape are very large." It is said that yams of the best liked variety (kặpinthol ẹn Pŏnipĕi) have reached as much as nine and ten feet in length and three feet in over-all diameter, with the individual roots that make up the bunch being about three inches in diameter. Because of the season during which the survey took place, as well as the secrecy surrounding yam farming, it was impossible to obtain any first-hand weights or measurements of large yams, but a reliable informant told of having seen a yam weighed on a scale at 100 kilograms. This was not even a competition yam, but one which was being sold to a Japanese.

Yams are classified in size by the number of men it takes to carry them. A yam that one man can carry is kặptạwạn. If two men are required, the size is kặi- and the yam is suspended from a pole between their shoulders. The name of the largest size is taken from the sling or "nest" (păs) between two poles in which they are carried by from four to twelve men, with from one to three at each corner.

On the basis of shape, the varieties of yams grown on Ponape can be classified into five types: (A) single yams that are long and slender and often from 3 to 12 inches in diameter and from 2 to 10 feet in length; (B) bunches of long slender yams similar to those in the group above that are attached together at the top, giving an over-all diameter of several feet for the bunch; (C) "branchy" yams that have many roots or branches coming out irregularly from a central core, either squarish or roundish in over-all outline, and several feet across if the branches are included; (D) single spherical yams about 12 inches in diameter; (E) groups of separate unattached spherical yams about 6 inches in diameter growing from a single vine.

Although it is size and not quantity that counts in prestige competition, the variety or shape of the yam is taken into consideration. No yam of type (A) ever requires more than two men to carry it, but a very large yam of this type may be judged best at a particular feast rather than a larger but not really outstanding yam of type (B), although a yam of type (B) is always carried by four or more men. Occasionally yams of type (C) have been acknowledged the largest, but the few varieties of types (D) and (E) that are grown are not used in competition. Yams of type (D) are too small, and a type (E) yam, although it has a single vine, counts as small separate yams because its parts are not attached together at the top.

Some varieties have distinctive shapes. One variety (thẹulimau) of type (E) always has five, and only five, round roots. Another variety is called "eel yam" (kặp läpwẹth) because it grows in a circle instead of straight up and down. Another is called "curved yam" (kặp kos or kạpin pălạng) because the root curves and does not grow straight down. Another (kặp arar) is described as starting down and then bending up, so that it grows in a U shape. Two varieties (kặp păini and kặpin Ĭap) grow out parallel to the ground and come up to the surface, the former about every two feet after dipping down again in between. Two are called "rock yams" (kặpin mwali pwẹtẹpwẹt and kặpin mwali pwŏmău) because the top of the root projects above the surface of the ground, looking like a rock. Some yams are flat instead of round in cross section (lŭkẹnăisăis motomot, ŏpwẹt, and kặpmair kạlik wăităta); in addition some are diamond or paddle shaped (năin pwatạl and kĭllimanipin kặpin kipăr). One variety (kặpin namŏ arẹmia) has a narrow bottlelike neck just below the vine.

The roots of several varieties are covered with fine, hairlike roots (kặpanai kạpạu or kăpạnai pạu, m̃pẹl ẹn kăpin namŏ, kặpin namŏ pạu, kăpanăin wai, and kait). Some have thorns or stickers on their roots and vine (kặpin lŏth or kặmpalai ẹn lŏth, Inosothi or kặpin matipw or kặmpalai in matipw, and kặpinăir ẹnwăi). The flesh of some varieties is described as watery, of others as hard, or starchy, or soft like flour; one variety is called "rope yam" (kặpsạl) because its flesh is full of fibers.

The varieties also vary in the shape and color of the leaves and vine, and the flavor, smell, and color of the flesh. The flesh of most yams is white, but a number have a reddish color, whereas others are described as pink, yellow, gray, brown, bluish, red with blue spots, white with blue spots, or blue and white. One variety is called "silk yam" (kḁp sĭlik), because it has a bright red flesh which not only makes the water red when it is boiled, but also colors all yams pink that are cooked with it. Another variety (kḁpin akitik) has white flesh but red skin. A number of varieties are described as having a sweet smell, like flowers (kḁpwŏmău pwętępwęt, kḁpwŏmău wăităta, kḁpin mwali pwŏmău, and kăpin tŏmara pwŏmău or mąnrălạng); it is said that the first-named variety can be smelled a hundred yards away when it is baking. Some varieties have a sweet flavor, which is not particularly liked (kḁpin matipw or kḁmpalai in matipw or ĭnosothi, kḁpin lŏth or kḁmpalăi ęn lŏth, kḁpin namŏ aręmia, and kḁpin pwăir or kḁmpwętępwęt); the first-named is so sweet that it is not eaten with meat.

These characteristics are often noted in the names given to the varieties. The words wăităta and pwętępwęt distinguish between those with reddish and light green leaves. "Good smell" (pwŏmău) and "hairy" (mpęl) or its equivalent "cold" (pḁu, kḁpḁu) also appear in the names. Two other terms that are frequently used are "changed" (kĭęwęk) and "thin skinned" (kĭlimanip), which are usually applied to local variants. Many new varieties of yams have appeared locally when cuttings from known varieties of yams have been planted and have grown into yams with different characteristics. They may vary in the shape or color of the roots or vines from the parent variety. These changes are stable, reappearing year after year.

To take a specific instance as an example, one variety (kunukuntha or kĭęwęk ęn Tamwęrŏi) was discovered locally in the Japanese period by the uncle of the wife of the present Chief B1 of Nęt, who acted as informant. It was named for B1's daughter, Kunukuntha, because it was discovered on the day she was born. Its alternate name refers to its discovery as a local variant in Tamwęrŏi (Section N2). The new variety has white flesh and consists of bunches of two or three roots each about 6 inches in diameter, giving an overall diameter of about 12 inches, and it is about 2 feet long. The cutting which was planted came from a variety (kḁpin nănpĕlam) that has reddish flesh and a single root about 12 inches in diameter and 5 feet long.

Many varieties have also been introduced into Ponape from the outside. For example, kḁpin nănpĕlam above is said to have been first grown in nănpĕlam farmstead on Lạngạr Island in Nęt District in the Spanish period. New varieties were brought in and appeared locally during the Spanish, German, and Japanese periods, but the largest number of those brought in from the outside are dated as introduced in the Pre-Spanish period, after contact with the outside world had first been established by the whaling and trading vessels. Before this, if informants today are correct, there were only a few varieties of yams on Ponape.

Interest is shown in all new varieties of yams, even those that are too small to be used in competition. This interest is not restricted to yams, but rather is characteristic of the Ponapean pattern of agriculture and is seen in the continued attempts to grow varieties of bananas that have been rendered practically useless by the root borer.

Yam cultivation is men's work, and, because of the secrecy surrounding it, it is an individual matter. Women generally have nothing to do with planting, training the vines, or harvesting the yams, and they are essentially bystanders in the competition associated with them. A very few skillful women help their husbands grow yams, and women may carry small yams from the farm to be eaten at home. Women cook yams when they are boiled or fried or warmed up on the "ashes," but yams are baked by men.

Three stages in the age of yams are recognized: (a) immature yams (kḁp pul, kḁp pulapul); (b) edible yams (kḁpma); and (c) rotten yams (kḁpwęl). The adjectives used to describe fruit, mature (ñkạl), ripe (mat), and rotten (matạnai), cannot be used with reference to yams. The adjectives applied to fruits, however, are used to describe raw yams (kḁpamas) and cooked yams (kḁpilęu). Yams are eaten only in the edible stage after cooking. Yam vines are not used either as food, in planting, or as pig food.

Very large yams, such as are desired in competition, can be produced only by selecting a good variety of yam, by planting and harvesting at the correct time, by planting in good soil in a good location, and by digging a very large hole, preparing it correctly with fertilizer, using a large enough cutting, trimming and training the vines properly, and protecting the vines effectively from pigs, cows, and other animals. Several varieties of yams which usually grow to only about 6 feet can be grown to lengths of 10 feet (kḁpinthol ęn Pŏnipĕi), 12 feet (ŏpwęt), and even 15 feet (kĭlimanipin kọkonępw pwętępwęt) if they are grown with special care in steep places on the side of a hill.

The care with which the Ponapean farmer grows his prize yams shows both knowledge and skill, and the labor he expends is far greater than would be necessary to produce the same quantity from a larger number of small yams of the same variety. Since the object is size and not quantity, questions about yield per acre, or total production in relation to the amount used as seed have little meaning to Ponapeans. They can, however, describe in detail the best way to grow large yams, if the barrier of secrecy is overcome.

Yams are grown in holes filled with alternate twelve-inch layers of fertilizer and earth. The fertilizer consists of decayed wood, grass, and dead vines and leaves of any kind (breadfruit and banana leaves are commonly used). These are recognized by the Ponapeans as being "food" for the yams. New holes must be dug each year, for yams get a "sickness" if planted in a hole used the year before, or if the ground around them is disturbed after they are fairly well grown.

The size of the hole (păręniak) depends on the size of the yam that is desired and on the shape of the variety of yam that is planted. Depending on the quality of the soil and the limits of the particular variety, it is said that a yam will grow a foot longer than the hole that is dug. For a four-foot yam of the favorite variety (kḁpinthol ęn Pŏnipĕi), a hole about three feet deep is dug, and four alternate layers of fertilizer and earth are placed in the hole and stamped down until level with the surface of the ground. If a six-foot yam of the same variety is desired there will be two additional layers and the hole must be five feet deep. This is not easy work with a digging stick.

On the top of the hole, a mound of earth about 9 inches high is formed in which the cutting is placed. The height of the mound varies from 6 to 15 inches, depending on the diameter of the hole, which may be from 2 to 4 feet depending on the shape and size of

the yam. Yams are said to be different from Cyrtosperma and taro in that yam roots grow down and not up and yam cuttings cannot therefore be planted in the bottom of the hole.

The yam cutting is planted about an inch below the surface of the mound with the cut face down and the eye from which the roots will sprout facing up. Placing the cutting in this position, so that the roots grow down over the edge of the cutting, is said to insure that they will grow down into the hole and not out in other directions. The cutting is set at a slight angle, so that the roots will grow directly down the center of the hole. Both these precautions are considered necessary so that the full depth of the hole and the full value of the fertilizer can be utilized.

The cuttings (pąk) that are generally used as seed are saved for planting when yams are eaten. They are taken from the top end (mäsęnpąk) of the yam, from which the vine grows. If enough cuttings have not been saved, whole yams may be cut up into sections, all of which are planted. When a good place for planting is available, half a yam three feet long may be used as a cutting; in poorer places, where large yams cannot be expected, smaller cuttings are used.

Not all varieties need be planted from cuttings. Some have vine seeds which may be planted (kąpinthol ęn Pōnipēi, which has very few, kọkonępw pwętępwęt or kąmpąkąi pwętępwęt, kọkonępw wäitäta or kąmpąkąi wäitäta, kīlimanipin kọkonępw pwętępwęt, lūkęnäisäis motomot, kīlimanipin lūkęnäisäis, kąmot or kąmotęlęl, kąp mwęąmwę, kait, and ōpwęt). These vine seeds, which are also eaten, are small, globular, starchy growths hanging from the vine like fruit. They are known by a special term (mwęąmwę) which is different from that for the seed (wär) or fruit (wä) of a tree, or the root (kanęng) of a yam. The vine seeds will sprout and take root when they fall to the ground, and the varieties that bear them may reproduce themselves once they have been planted. All other varieties of yams, except the "Western yams" and wild yams, have to be replanted each year.

For certain varieties of yams a cutting can be planted twice. When a cutting has sprouted it becomes rotten (wę̄l) and is generally of no further use. For a few varieties (kąmpwathęwēl pwętępwęt, kąmpwathęwēl wäitäta, kīlimanipin kąmpwathęwę̄l pwętępwęt, and lępwąk ęn kąmpwathęwēl) it is possible to dig down to the root, reach in with the hand (pwath) and cut off the rotten cutting (wę̄l) without harming the new root, and plant the cutting a second time.

Yams must be protected from pigs by fences about two feet high and from two to four feet square, built of rocks or roofing tin about the hole. Before the war pigs were usually fenced in during the season when yam vines were growing. Wires are put through the noses of pigs to keep them from rooting and knocking down the fence. Cows must be kept out of the farm or tethered out of reach of the yam vines. Although there are no insect pests or diseases that attack yams on Ponape, snails have become a real problem in the area about the Colony.

The Ponapeans believe that two places are best for growing the largest yams: where a hibiscus tree has just been burned, and at the base of breadfruit trees. The former is a discovery made in the Spanish period by some men from Section K21 of whom four, Samuel, Daniel, Louis, and Luther, were still living. The discovery was made when yams were planted on land that had just been cleared for coconuts. When it was observed that yams grew faster and larger in those spots where hibiscus trees had been burned, the experiment was repeated until the men were convinced. The traditional and still the commonest place for growing very large yams is beneath breadfruit trees, where the vines can be trained up into the treetop. Here they are said to last longer than anywhere else, and can be left without harvesting for 10 to 20 years without spoiling. From the appearance of the ground about the tree and of the tree itself, the farmer decides the number of yams it can best support and how large they are likely to grow, and he plants accordingly.

Less favorable places are utilized for growing smaller yams for household use. Some are planted under coconut, citrus, or other trees, and a few people have grown yams in open fields, where they are planted in rows and trained up mangrove poles stuck in the ground for that purpose. Such yams rarely if ever reach competition size.

Although the people of Ponape have sometimes been criticized because they do not plant their crops in regular even rows, they give sound reasons for the untidy appearance of their farms. By planting yams in scattered places in the farmstead and in the mountain farms, they can use the most productive spots of land and at the same time hide their yams from visitors and passers-by. By leaving part of the farmstead uncleared, when they have land enough to do so, hibiscus trees are available close at hand for their many household uses, and for burning when the time comes to plant yams. Similarly, yam vines are trained into the branches of breadfruit trees because beneath them the best soil is found and not simply because this is easier than putting up rows of sticks in an open field.

The Ponapeans know that to grow large yams, the leaves must "reach the sun." When the vines are about four feet long, they are trained up hibiscus bark, hibiscus poles, or bamboo poles that reach into the branches of a tree. Hibiscus poles an inch or two in diameter and about twenty-five feet long are cut, from which the bark is peeled lengthwise in strips about half an inch wide. A stone is tied to one end of a strip of untreated bark and thrown up into the branches of the tree, or the peeled hibiscus poles (or in recent times bamboo poles) of about the same dimensions are leaned against the tree, with one end placed inside of the stone or tin fence. When the vines are trained (kän thau) they are also trimmed as needed to remove all lateral branches.

It is difficult to discuss seasonal aspects of yam cultivation because of the different growth habits and different planting and harvesting seasons of the many varieties. The main planting season is said to begin in December and to end in March. Most yams are planted in February, fewer are planted in January, and still fewer in the initial and final months of the planting season. Regardless of when they are planted, most varieties do not begin to sprout until after the rains begin. Some early varieties sprout when the first rains come, about March, others sprout in April, and some late varieties do not sprout until June. Yam vines are first tied about May. Most yams are fully mature by the beginning of the season of the trade winds, when the vines wither and growth stops. This is the main harvest season (Isọl), about January, although different varieties have different periods of harvest and, as indicated earlier, yams are frequently consumed before they are fully grown.

For some varieties, however, the vines sprout and must be tied during the trade winds. The vines of these

varieties (kặpanain wäi, kặpanai pạu or kặpanai kạpạu, lẹpwẹk ẹn kặpanai, kĭẹwẹk ẹn kặpanai, m̃pẹl ẹn kặpanai, and kait ẹn kặpanai) wither and die when the rain begins, and the cuttings must be planted very early in the season of trade winds and harvested before it ends. The vines must be protected from the early rains by being covered with leaves. The vine of another variety (kặpin akitik) sprouts and dies twice during the year, growing up into the treetops each time. The vines of several other varieties, which are known as "Sleeping Over Yams" (kặmair kalik pwẹtẹpwẹt, kặmair kalik wäitäta, kĭlimanipin kặmair kalik, and kặmair kalik motomot), wither and die with the first rains but are very slow in maturing. They are planted in the usual season but are not harvested until May-July of the following year, whence their name. These varieties and only a few others (mäsọlẹl, and lŭkẹnäisäis motomot) can be eaten in the spring in-between season.

Yams are left in the ground until they are used. Unless someone is going on a trip, only enough yams for the daily needs of the household are brought home. If yams are left in the ground until they sprout, they become rotten and cannot be used until the following harvest season. If they are not disturbed, however, they grow larger every year. Some of the largest yams are produced by digging up the entire yam and replanting it in a new place each year for five or ten years, but most of the yams used in competition are new, having been planted in the same year they are harvested. Yams that are left in the ground untouched or that are replanted whole for several years are grown on the farmstead, whereas the mountain farms, which are abandoned each year, are used for the growing of new yams.

No attempt is made to preserve yams for the in-between seasons, although there is no evidence that this could not be done successfully. (Around Calabar in Nigeria, for example, where both rainfall and humidity are high, yams are simply tied on racks.) Yams have been known to keep for three months during the rainy season on Ponape without spoiling when simply left on the floor inside a house. Again, the explanation is apparently to be found in the pattern of prestige competition rather than in the satisfaction of traditionally recognized economic needs. Yams are left in the ground for reasons of secrecy, so that people will not see what kind of yams they are until it is time to use them.

4. "Western Yams" (käpinäir).—Eight varieties of "Western yams" (kặp watik, kặp walap, ämarapạ, m̃po, kumutẹnkiti, kặpmwas, watik ẹn ämarapạ, kặpwatik ẹn kặpwalap) were recorded. The first variety is regarded as the best in flavor, and the first three are the most popular varieties in order named. Three varieties (kặp walap, kặpmwas, kặpwatik ẹn kặpwalap) were identified by Fosberg as Dioscorea, but as we have indicated all "Western yams" are regarded by Ponapeans as being different from yams and are never used in prestige competition. They have no season, and can be planted and harvested at any time of year. All varieties are found growing wild, and all are said to date from the Native period. All varieties are occasionally cultivated, and a few individuals who prefer them to other yams plant them in large numbers.

"Western yams" have many vines and small, separate stringy roots, which are three inches or less in diameter. The roots grow out in many directions, sometimes down into the ground and sometimes out just under the surface, depending upon the variety. The "worm yam" (kặpmwas), for example, is described as having from six to ten roots less than an inch thick and up to twelve feet in length which spread out in all directions just beneath the surface of the ground, often coming up above the surface.

Planting and harvesting is the work of men. For planting, the roots and the many vines are trimmed off, giving a cutting (mäsẹnpạk) which is said to resemble the stems of a bunch of grass or ferns. This is placed on top of ground that has been loosened with a digging stick to the depth of one foot. No fertilizer is used. "Western yams" are baked or occasionally roasted. They are used as a substitute for yams or breadfruit either in the spring or the fall lean periods.

9. AGRICULTURE

OTHER CROPS

The crops discussed in this chapter are less important than the three primary crops, coconuts, breadfruit, and yams, and are again dealt with in the order of their importance.

5. Alocasia (ŏth). Nine varieties of Alocasia were recorded, of which one (sapwikin) was identified by Fosberg as Alocasia macrorrhiza. Seven varieties (ŏthęlęl, ŏthąnai, ŏth ęn kąpinę, ŏth ęn tawăk, sapwikin, litaiyang, and salęng wălęk) are both wild and cultivated and are said to date from the Native period. One variety (ŏth ęn Mwǫkil) was introduced from Mokil, and another, which is called "afraid of ghosts" (mĭsikăni) because it dies unless it is planted close to the house, were introduced in the latter part of the Japanese period. Neither of the introduced varieties grows wild. The most popular and widely used of all varieties is salęng wălęk.

Alocasia is usually found growing wild in and around streams and fresh-water marshes, but those growing in the water are cut down to make room for planting Cyrtosperma. They are said to "bite" or "scratch" the mouth and cause the mouth and face to swell up so much that they cannot be eaten, presumably because they contain calcium oxalate crystals as do the skin and leaves of taro. Wild plants growing on dry land near water have less of this effect but even these plants cannot be eaten until the outer skin has been removed, probably because the crystalline deposit is concentrated in this region. To avoid this "bite" or "scratch," Alocasia is planted on dry land and most of that used is from cultivated plants.

Alocasia is the most common substitute for fresh breadfruit and yams. It is said to be the second oldest food on Ponape. Every family grows Alocasia and some have more than one hundred cultivated plants. It is planted by both men and women, but because of its large size and weight only men can carry it home and some people regard its cultivation as properly men's work. Alocasia has no season and can be planted and harvested at any time of year. It is used, however, mostly in the fall (October to November) and spring (April to May) periods between the yam and breadfruit seasons. The corm is baked on hot stones or boiled before eating.

Cuttings (pąk) taken from the top end (mäsęnpąk) to which the leaves are still attached are planted in holes made with a digging stick. The plant is said to grow up instead of down. The cutting is placed at the very bottom of a hole a foot and a half deep and nine inches in diameter and covered over with dirt. The edible portion of Alocasia is the corm or part of the stalk above ground that is formed by the shedding of leaves and petioles, neither of which are eaten. This has a greenish skin and a white flesh which is described as having a texture like yams. Ponapeans call this part the "root" (kanęng) and regard it, rather than the small stringy roots that grow out from its base, as the equivalent of the yam root. The largest Alocasia "roots" (corms) are from 12 to 15 inches in diameter and 6 feet or more in length. Alocasia is not attacked by leafhoppers or other insects, but it is frequently destroyed by pigs. Wires in the noses of pigs prevent them from eating the small stringy roots, but do not protect the edible portion above ground.

6. Cyrtosperma (mwăng). Twenty-nine varieties of Cyrtosperma were recorded, of which three (mwäng ęn mair, mwäng ęn Nukuor, mwäng ęn Ngatik) were identified by Fosberg. Of the twenty-seven varieties with which informants were familiar, twenty-one were said to date from the Native period and to grow both wild and cultivated and six, which have been introduced since contact, are only cultivated. There seems to be much more variation from one part of the island to another in the varieties of Cyrtosperma that are known and planted than for any other crop, perhaps because so many grow wild.

All Cyrtosperma are planted in very wet places, the favorite being the fresh-water marshes. Because Ponapeans were not allowed free access to these marshes by the Japanese, Cyrtosperma is much less important now than it was in the German period. Many people have given up the crop almost entirely and only those who have muddy stream beds on their farms use it extensively; in such places some rocks may be put across the stream bed to keep the Cyrtosperma under water. Most of the Cyrtosperma eaten grows wild, but it was commonly planted until the Japanese period and cultivation will probably be resumed when native rights to the fresh-water marshes are re-established.

Cyrtosperma, which is generally baked among hot stones or boiled, does not have the "scratchy" or "biting" effect of Alocasia and taro. The petioles as well as the "root" (corm) are sometimes eaten; they are called "Cyrtosperma taro" (sawăn mwăng) because they taste like taro after baking. Cyrtosperma has no season. It is planted and harvested at any time of year, but it is used primarily during the fall and spring lean periods in place of yams and breadfruit.

Planting and harvesting is the work of men. Cyrtosperma is planted in a hole a foot deep which is made by pushing a digging stick into the mud at the bottom of a marsh and wiggling it around to enlarge it. Cuttings (pąk) from the top end (mäsęnpąk) of old "roots" (corms) are planted, or a young plant is dug up completely and replanted in a new hole. The growth of Cyrtosperma is upward and cuttings are placed at the bottom of the hole.

Cyrtosperma is often allowed to grow for several years before being harvested, both the plant and the corm reaching large size. Chief B1 of Nęt District says that in nine years he grew a "root" of one of the larger varieties (simĭthęn) that was 6 feet long and 15 inches in diameter. Occasionally Cyrtosperma plants with their large tarolike leaves reaching 15 to 20 feet high can be seen. Cows and some domestic pigs eat Cyrtosperma leaves, though the latter can be kept away from the roots by nose rings. There is no protection against wild pigs or snails, which are the main pests. Deer and insects are no problem.

7. Taro (sawa). Seventeen varieties of taro were recorded, aside from "Hawaiian taro" (sawăn Awaĭ), which is regarded by Ponapeans as a variety of the

same plant. The varieties are distinguished by whether they grow in wet or dry places and whether they are cultivated (C) or wild (W) or both cultivated and wild (CW), as well as by morphological characteristics.

"Tiny flowers" (kẽiwatik). Dry (C) Native period.
"Red taro" (sawa wãitãta). Dry (C) from Kusaie in German period.
"Truk taro" (sawãn Rũk). Dry (C) German period.
"Saipan taro" (sawãn Saipãn). Dry (C) Japanese period.
"Japanese taro" (sawãn Sapãn). Dry (C) Japanese period.
"Daniel's" (nãin Thãniẹl). Dry (CW) recently found in the mountains.
"Palau taro" (sawãn Pãlau). Wet or dry (C) Japanese period.
"Green stem" (pãmạru). Wet (CW) Native period.
"Kũẹt (meaning unknown). Wet (CW) Native period.
"Blood stem" (pãn ñta). Wet (CW) Native period.
Thoku (meaning unknown). Wet (CW) Native period.
"Shrimp taro" (sawa likathạpw). Wet (CW) Native
"Garland taro" (sawãn mwaramwar). Wet (W) Native period. Not eaten.
"Mortlock taro" (sawãn Mọtilọk). Wet (C) German period.
"Chamarro taro" (sawãn Samoro). Wet (C) from Marianas in German period.
"Nukuoro taro" (sawãn Nũkuor). Wet (C) German period.
"Kusaie taro" (sawãn Kusai). Details unavailable.

An eighteenth variety, which has not yet been adopted or given a name by the Ponapeans, is being grown on Ponape by the Mortlock people. In addition, there is "garland taro," which is not used for anything except pig feed and as a source of flowers for the hair and for garlands. It is the only taro listed that is never cultivated or eaten.

Two varieties (Kusaie taro and garland taro) were identified by Fosburg as Colocasia esculenta, and it is assumed that all varieties of sawa (except "Hawaiian taro") are Colocasia. The most popular variety is "red taro" because of its flavor and because, with "Truk taro," it is one of the two largest. Japanese records show the production of 519.8 tons valued at about 22,200 yen and 85 hectares planted to native taro, and 5.7 tons valued at about 784 yen and 3 hectares planted to Japanese taro in the Ponape Branch Bureau in 1937.

Most of the taro used comes from cultivated rather than wild plants. Taro planting and harvesting is women's work, and though the Ponapeans know that the people of Nukuoro, the Mortlocks, Mokil, and Pingelap use fertilizer with taro, they do not do so themselves. A cutting (pạk) from the top end (mãsẹnpạk) of an old root is planted. It is believed that taro, unlike yams, will not grow from cuttings made from other parts of the tuber. Alternatively a young taro plant can be dug up and replanted in a new hole. A hole about a foot deep and six inches across is made with a digging stick, and the cutting is placed in the bottom of the hole and covered over with dirt since most of the growth of taro is upward. To permit taro to grow larger a mound of earth is built up over the hole so that the root may grow higher than the original level of the ground. Taro is also replanted annually so that it will grow to large sizes.

Until the Japanese land restrictions were imposed the wet varieties of taro were planted near the freshwater marshes and the dry varieties were planted in the mountain farms. Taro was seldom planted in the farmsteads since it does not do as well under the shade of breadfruit and coconuts as it does in a cleared area. Taro, which can be planted at any time of the year and can be harvested in four months if planted in the open or in five or six months if planted in the shade, is usually planted during the rainy season (May, June, and July) so that it will be ready in October and November, when yams and breadfruit are scarce. Harvesting starts when breadfruit begins to disappear, and continues through October, November, and early December. Taro is far less important on Ponape than on the atolls. It ranks sixth in order of preference and use among the starch foods. It is baked or boiled and eaten as a substitute for breadfruit and yams. Apparently poi is not made, though taro can be used instead of breadfruit in making lĩli and can be eaten with coconut milk after being baked and pounded, and boiled taro is commonly served with coconut milk. When taro is cooked, the skin must be carefully peeled from the roots of all varieties, because they contain calcium oxalate crystals that cause the mouth and face to swell. These crystals are also found in the leaves of all varieties except "red taro." Some people add the chopped leaves of "red taro" to blood that is being roasted in hot stones. If other varieties are used, only the youngest leaf can be picked from each plant. Since the German period, a few people have started to eat the petiole of "red taro." This is prepared by cutting it into five-inch lengths, boiling and peeling it carefully to remove the crystals, and squeezing coconut milk over it.

Taro is not bothered much by domestic pigs though a few "bad" pigs, which can be kept away from the roots by nose rings, eat the leaves. Wild pigs, however, root up and eat all kinds of taro, but cows and deer do not bother it. Snails cause a great deal of trouble, but the main taro pest is the leafhopper (identified by Oakley as Megamelus proserpina Kirkaldy). This was introduced in 1921 with the variety "Saipan taro," according to informants. During that year it destroyed so much of the crop that taro planting was abandoned except on a very limited scale. The leafhopper is said to attack all varieties of taro and also "Hawaiian taro" but no other crops. It is said to be more destructive to taro planted in the open than to that planted in the shade. The Japanese were asked for methods for controlling the leafhopper but they offered no suggestions. Although taro is of only secondary importance, the Ponapeans were still anxious to learn a successufl method of control.

8. "Hawaiian taro" (sawãn Awaĩ). "Hawaiian taro" is regarded by Ponapeans as one of the varieties of taro (sawa), and it is planted and eaten as such. It differs botanically from taro in having a glossy top and a whitish bottom surface to the leaf, and it is not the same as Alocasia or Cyrtosperma. It was introduced from Hawaii in the Japanese period. It is the most popular of the varieties of sawa because it does not "bite" or "scratch." The roots can be eaten "like yams" without needing to have the skin peeled off before they are boiled, and it is even more widely planted and widely used than "red taro." The roots, petioles, and stems are all eaten by pigs. "Hawaiian taro" is especially susceptible to the taro leafhopper. During the war when food was scarce Chief Bl of Nẹt urged each section in his district to plant it on a large scale. He says that a total of 200,000 plants were set out be-

tween December 1944 and February 1945, but by June they had been wiped out by the leafhopper.

9. Bananas (üt). Forty-one native varieties of banana and plantain were recorded. Of these, twenty-seven are grouped into three major classes (mangat, utithol, karat), named from a typical variety within each class, and nine fall in four minor categories. The classification was not determined for five varieties (kirọulẹtẹk, kalapwa, tukuru, kerenlasi, and iyạpnai) listed by an informant from Ū District.

Mangat bear fruit throughout the year and do not grow wild. The bananas turn yellow when ripe and are generally large and long, a foot or more in length and about two inches in diameter. Two varieties (üt ẹn Taiwang and Inäsio) are of medium size like utithol varieties; one (karat ẹn Ïap or karat ẹn läm) is shaped like karat, whence its name. Twelve of the recorded varieties were of the mangat type (mangat or mangat ẹn Pōnipēi, mangat ẹn alōkap, mangat ẹn Rük, üt ẹn Saipän, üt ẹn Ẹpōn, Ïyạpmwän, Ïpali, m̄pẹl, kingit, and the three named above). Mangat bananas are rarely eaten raw; they are usually boiled, baked, roasted, or fried. Only bananas of the mangat type are roasted in the ashes.

Utithol varieties likewise bear fruit throughout the year and do not grow wild. The bananas also turn yellow when ripe but are of medium size, about six inches long and an inch and a half thick. Eight varieties were classed as utithol (utithol, saptärạng, lakatän or kalatän, üt ẹn Manïla or üt ẹn Kūam, Prēsil, üt ẹn wäi, klẹwẹk ẹn ütẹnwäi, and pẹlẹu). Utithol bananas are all sweet and are eaten raw; some are cooked as well.

Karat bananas bear fruit only during the rainy season, except for one variety (utumwot) which has no season and another (tikäp) which is said to have no fruit at all. They grow wild and are also cultivated. The bananas turn red when ripe and are very fat, varying in size form five inches long and three inches thick to eight inches long and four inches thick. The stalk grows straight up instead of bending over and hanging down. Eating karat bananas is said to turn the urine a bright yellow. Seven varieties were classed as karat (karat, klẹwẹk ẹn karat, karat ẹn alōkap, karat kōlẹ, karat ẹn pälil, utumwot, and tikäp). Karat bananas are rarely fried or eaten raw; they are usually baked or boiled.

Utiäk or "Mangrove bananas" resemble those of the utithol type in some ways, but are described as very sour. They do not grow wild and they bear fruit throughout the year. The bananas turn yellow when ripe and are of medium size, about six inches long and an inch to an inch and a half in diameter. Four varieties were classed as utiäk (utiäk or tuiäk ẹn Pōnipēi, klẹwẹk ẹn utiäk, utiäk ẹn Pälau, and utiäk ẹn Angao or utiäk ẹn wäi). They are eaten raw or boiled and some varieties are baked, but none are fried.

Two varieties (utūn Ïap and ütumwas) bear fruit only during the rainy season and are both wild and cultivated. The bananas stay green in color even when ripe. Those of the former variety are of medium size like utithol, while those of the latter are only about three inches long and an inch in diameter. Both have black markings on the trunk, and the sap of the former is so black that it is sometimes used instead of ink. Both are baked, but never boiled and only rarely eaten raw or fried.

There are two varieties of "finger" bananas, both of which are tiny and very sweet. Both bear throughout the year. One (kütuth) does not grow wild, but the other (ütẹn wạl) which is shorter and almost round, is both wild and cultivated. The fruit turns yellow when ripe and is an inch thick and an inch and a half or two inches long. Both varieties are only eaten raw.

Abaca, which is known as the "rope banana" (utisạl) is regarded as a banana in a class by itself, though the fruitless variety (tikäp) of karat is sometimes included with it. Neither has any uses for food purposes. Except that it has no edible fruit, abaca is regarded as similar in appearance to the karat type. It was introduced in the Spanish period and does not grow wild.

About fifteen of the forty-one varieties are said to date from the period before European contact, including varieties of all seven types except abaca. Two types, (karat, and utūn Ïap) or perhaps the varieties from which the types are raised, are mentioned in legends. By the Spanish period the most popular banana was that known as "Brazil" (Prēsil) which had been introduced from Brazil in the pre-Spanish period by Mr. Doane, an American missionary. The other main varieties were karat, utūn Ïap, and ütẹnwäi.

In the German period there was a change. These and many of the other bananas began to die off, though no one knew the cause. New varieties of bananas that were better able to survive were tried. A new variety introduced in the German period, "Guam banana" (üt ẹn Kūam) became important.

Two years after the beginning of the Japanese administration the banana root borer (identified by Oakley as Cosmopolites sordidus Germ.) was discovered. A number of Ponapeans believe it was introduced from Japanese ships calling at Ponape, but it may have been the undiscovered cause of trouble in the German period. The borer, a small white grub with a reddish head, bores into the heart of the trunk making the leaves wither and turn yellow. The plant stops bearing fruit and in time dies and falls to the ground. During the Japanese period all older varieties of bananas were badly hit.

As in the case of the taro leafhopper the Japanese offered no remedies. On their own, Ponapeans tried burning the infested plants, burning over entire fields, and planting bananas in holes filled with ashes, but with no success. Only one, unsatisfactory, way of growing the older varieties has been found, that of replanting them frequently in new places. A new plant may not be attacked for two or three years, or it may be killed before it can bear fruit. At the present time Ponapeans still show agreat deal of interest in the older varieties and are very anxious to find a remedy to control the borer. In the Japanese period they also continued to search for new bananas that could withstand the worm, and about ten new varieties were brought in from Palau, Angaur, Formosa, the Marianas, the Philippines, the Marshalls, and other islands in the Pacific. Three of these are now the most important and widely used bananas on Ponape. All of them are able to withstand the borers, which are said to be found in all three varieties but are unable to kill them.

The most important variety, kalatän or lakatän, is not only borer resistant, but is also an excellent banana for eating. The Ponapeans regard it as the best of all the varieties, old and new. It was the favorite of the Japanese, and it is very well liked also by the Americans, who regard it as better than any variety on Truk. If there is any opportunity to develop bananas commercially for export, this variety shows the greatest possibilities. It is of the utithol type, and is eaten by the Ponapeans raw, fried, boiled, or baked

on hot stones. The second most widely used variety is the "Manilla banana" or the "Guam banana" (ŭt ẹn Manïlla or ŭt ẹn Kŭam). This variety was introduced from the Philippines in the Japanese period, and it was not until after it had been given a new name that it was discovered to be the same as the variety introduced from Guam in the German period. This is also of the utithol type and it is eaten raw, boiled, or baked, and less frequently fried. The third in present popularity is the "Taiwan banana" (ŭt ẹn Tăiwang), introduced from Taiwan (Formosa) in the Japanese period. It is of the mangat type and is very seldom eaten raw, but is boiled, baked, and fried.

Although for most of their bananas they depend on these three varieties, each farmer plants several varieties, including some of the older ones just to keep them alive. As a result most of the forty-one varieties can probably be found somewhere on the island, although most of them have ceased to have any real economic importance. Of secondary importance, after the three borer-resistant bananas, are three varieties (karat, utŭn Ïap, and karat kŏlẹ) all of which are seasonal and which are seldom eaten raw. Japanese records show the production of 530.3 tons, valued at about 26,600 yen, and 85 hectares planted to bananas, in the Ponape Branch Bureau in 1937.

Bananas are also killed by pigs and cows. Nose wires do not stop some pigs from eating the stalk of both kalatăn and ŭt ẹn Manïlla, the two most widely used varieties. Banana plants are sometimes protected by a fence of coconut leaves, and pigs may be dissuaded from eating bananas by feeding them regularly, but not many Ponapeans do this. Cows also eat banana leaves and banana stalks, killing the entire plant. Bananas cannot be grown unless cows are kept tied or fenced in. Wild chickens eat the fruit of bananas, but do not kill the plant, and domestic chickens cause no trouble.

Cooked bananas (utilẹu) are used as a substitute for yams and breadfruit, particularly in the spring when the seasonal types (karat, utŭn Ïap) are available. These mature early in the rainy season after the yams have sprouted and begun to rot and before the breadfruit season has begun. Raw bananas (utamas, ŭt wẹt) are eaten only after and between meals, and may be kept about the house for this purpose. Although the six types of edible bananas can be classified as "eating" or "cooking" bananas, this is an oversimplification because the patterns of consumption vary from one variety to another. Although most of the bananas of the utithol type are eaten only raw, the two most important ones today are also cooked in several ways. The method of cooking that is used also depends upon the type and the variety of banana.

Cooked bananas are eaten with salt and chili pepper. Baked bananas (ŭt ŭm) are cooked in their skins on the hot stones; generally the karat type is used. Boiled bananas (ŭt ăinpọt) are also cooked in their skins, after which they become hard and are said to taste like taro. For roasted bananas (ŭt păs) only mangat varieties are selected; they are cooked in their skins in hot ashes. Fried bananas (ŭt pirăin) are not commonly used, but can be prepared by peeling, slicing in half, and frying in coconut oil or lard an inch or more deep. Banana stalk is eaten only in time of famine, though the outislanders from Mokil, Pingelap, and Ngatik eat it at other times. They take a fallen and disintegrating stalk, knead it with the fingers into dough and either bake it on hot stones wrapped in leaves or boil it.

The stages of growth of the banana parallel those of the breadfruit. For frying and for roasting in the ashes, ripe bananas (ŭtimat) are generally used; mature bananas (ŭtiñkạl) are used occasionally, and immature bananas (ŭtupul) are never used. For boiling and for baking in hot stones, mature bananas are used mostly, ripe bananas occasionally, and immature bananas rarely. Only ripe bananas are eaten raw. Mature and ripe bananas are classed as "edible" (ŭtimă) but not immature bananas or those which are overripe or rotten (ŭt matạnai).

Both men and women plant, tend, and harvest bananas. Although properly the cultivation of bananas is regarded as women's work, this distinction has almost no meaning today. They are the one agricultural crop that can be considered as the work of both sexes. Wild bananas are sometimes eaten, but by far the greatest proportion of those used come from trees that have been planted and are privately owned. Bananas are planted in the farmstead, and, until the Japanese period, in the mountain farm, where anyone was free to pick and use them after the field had been abandoned.

Bananas are planted at any time of year and, except for the seasonal varieties, bear fruit after about six or eight months. The new borer-resistant varieties continue to reproduce themselves once they have been planted, growing into large clumps that last indefinitely, as did all varieties before the appearance of the root borer. To make bananas grow better they are replanted when they begin to bear poorly. In planting, new sprouts (ŭl, ilẹnut) growing out from the clump are cut off and set in the bottom of a hole one foot deep, which has been made with a digging stick. If a large sprout is used, the hole is made a foot and a half deep and the sprout is trimmed off at the top to a length of about three and a half feet, so that about two feet sticks out above the ground. The sprouts are cut very close to the ground so that they have an inch or two of root at the bottom. After cutting they are allowed to stand for five or six days before planting, so that they do not wilt so much when planted but take root and sprout more quickly.

Bananas have no place in the prestige economy. Besides their use for subsistence purposes, they were of minor commercial importance. Bananas were sold to the Japanese in the market at Colony, for use in homes and restaurants, by people from all parts of the island who brought them in by canoe, but the trade was never on a really large scale. A few families in Kiti District were said to sell the most. Ponapeans were told to bring bananas of the kalatăn or lakatăn type, but all kinds were accepted and the Japanese bought all that were brought in. The trade increased during the early years of the war but fell off after the Colony was bombed, when all the Japanese were busy building new homes in the hills. One of the first forms of private commercial enterprise established by Ponapeans after the American occupation was a store or stall in which bananas were sold. It was making good money at the established prices because many natives employed by Military Government had almost nowhere else to obtain food.

10. Sweet potatoes (pwẹtẹtẹ). There are said to be a number of different varieties of sweet potatoes on Ponape, but they were not recorded. Sweet potatoes were first introduced during the Spanish period, but they have not been widely accepted. They grow well on Ponape, but their sweet flavor is not particularly liked and they are regarded as more trouble to grow

than they are worth. Prior to the war they were not grown or used to any extent by the Ponapeans themselves, though they were grown by Mortlock families and other out-islanders as well as by the Japanese. Japanese records show the production of 250 tons valued at about 18,650 yen, and 25 hectares planted to sweet potatoes in the Ponape Branch Bureau in 1937.

During the war large quantities were grown by the Japanese. Particularly in the neighborhood of the Colony, fields of sweet potatoes were abandoned when the Japanese were evacuated from Ponape. These were made available to the native prisoners and to the employees of Military Government who had no opportunity for full-time farming and some of whom had no land of their own, on the condition that the fields be replanted as the sweet potatoes were harvested. These again were used more by out-islanders than by Ponapeans, but it is believed that sweet potatoes have become somewhat more popular among Ponapeans as a yam and breadfruit substitute as a result of their large-scale production by the Japanese during the war.

No sweet potatoes grow wild. The present method of planting is a combination of the old way learned in the Spanish period and that used by the Japanese. In the Spanish period hills of dirt two feet apart were prepared by men with the use of a digging stick. The bottom end of a long potato vine was stuck into the bottom of each mound and the vine was wound spirally around the mound up toward the center. No fertilizer was used and the vines were not shaded from the sun, but they were kept trimmed to a length of two feet after they had sprouted. Trimming was done about once a week during the full period of their growth.

The Japanese employed both Ponapean men and women during the war to grow sweet potatoes, so many are familiar with their method. The field was first plowed by carabao, and a long single mound running the length of the row was prepared. In this old vines and leaves were buried as fertilizer, and short cuttings of vine were planted two feet apart. The Japanese planted and harvested two crops a year, one in the spring and one in the fall, and also trimmed the growing vines weekly to a length of two feet. The Japanese method of planting, particularly the preparation of the long mounds, is regarded as unnecessarily laborious. The few Ponapean families who plant sweet potatoes today have retained the use of round mounds or hills from the Spanish period, but now plant short cuttings like the Japanese and sometimes add old vines, leaves, and grass as fertilizer. Even this method of planting sweet potatoes is regarded as very hard work in relation to the yield.

On at least one occasion, sweet potatoes have been planted like yams, with rather spectacular results. One man grew a sweet potato that was two feet long and four inches in diameter in six months, using a hole filled with layers of leaves and grass dug under a breadfruit tree. This method of planting has not been adopted, however, because yams are preferred and because the sweet potato vines covered the branches of the breadfruit tree and almost killed it. Yam vines do not interfere with breadfruit, since they wither and die just about the time the breadfruit harvest begins.

Although the pattern is by no means set, and both sexes may plant and harvest sweet potatoes, this is generally considered to be women's work. Sweet potatoes are generally harvested from four to six months after planting. They are usually planted in the spring with taro so as to be ready for the fall period when yams and breadfruit are scarce. They are replanted again at the time of the fall harvest so they can be kept alive until the spring planting season. In this way sweet potatoes are available for food in smaller quantities during the other lean period in the spring.

Both the roots and the leaves of sweet potatoes are eaten, the latter custom having been learned from the Japanese. The leaves are fried and eaten with lemon and chili pepper, and are very well liked; but they are used only by the few families that grow sweet potatoes. Vines are used as pig food by Ponapeans and were similarly used by the Japanese. Both deer and pigs eat sweet potato vines, and the families that grow sweet potatoes must keep their pigs fenced in.

11. Cassava (käptūka). Six varieties of cassave were recorded that do not have distinctive names. All are known by the general term, which means "tree yam." They have the following characteristics:

(a) reddish leaves and reddish skins on the roots;
(b) pale green ("white") leaves and light ("white") skin;
(c) grayish (color of ashes) leaves and light skin;
(d) grayish leaves and yellowish flesh;
(e) green leaves, light skin, and sweet flesh;
(f) green leaves, light skin, white flesh with a thin reddish layer just under the skin.

Although the first variety (a) is regarded as dating from the Native period, it is almost certain that cassava, like chili pepper, was introduced through contact with the outside world, as cassava is a domesticate of South America. The other five varieties were all introduced in the Japanese period. The last variety (f), which was planted in large quantities by the Japanese, is regarded as the best by Ponapeans although, like sweet potatoes, cassava has never been very important. This last variety is described as having a great deal of starch; it is nonpoisonous, and can be dug up, washed, and baked in hot stones like a yam, although some people are said to get headaches from eating it in this way. The sweet variety (e) has no poison at all, and is usually eaten raw. The "native" variety (a) is the most poisonous. It is said that during the war when the Japanese were experimenting with native foods, several died from eating it without having prepared it properly.

Cassava does not grow wild, though many fields abandoned by the Japanese are seen around the Colony. All varieties are grown today, with (f) being the most widely used and (a) the least. Cassava is planted at the same time as taro and sweet potatoes, and harvested four or five months after planting. It is most commonly eaten during the fall period when yams and breadfruit are scarce. Like sweet potatoes it is usually replanted at the time of harvest so that it can be kept alive until the next planting season, and small quantities will be available for food during the spring lean period.

Planting and harvesting cassava is women's work. The stem is cut into pieces about six inches long which are stuck into a small hill of dirt over a hole loosened with a digging stick. The hole is about a foot deep and a foot in diameter, and the mounds are laid out in rows one foot apart. Two pieces of stem are stuck into each hill, both at an angle and on the same side of the hill. Cassava roots are never planted. Cassava is often destroyed by wild and domestic pigs, but it can be protected from the latter by nose rings and fences. Snails are a menace, but there are no insect pests.

Cassava was produced on a large-scale basis by the Japanese on Ponape for a time, when the Kohatsu Company first established their plantation near Sapalap in Matālanim. Clearing the plantation began in 1934 after 2,592 acres of land were acquired, and by 1936, 1,284 acres were planted to cassava. The following year 10,140 metric tons of roots valued at 91,260 yen were produced and 1,978 metric tons of processed cassava valued at 197,839 yen were exported. The two illustrations of the tapioca plantation and processing plant in East Caroline Islands (OPNAV 50E-5, Page 191) undoubtedly show this undertaking. Contrary to what this report says, however, this undertaking was not successful. Cassava was abandoned as soon as the 1937 crop had been harvested and the plantation was converted to sugar. The reason for this move is not known for certain, but Carlos Etscheit reports hearing that the cassava was being used in Japan for the manufacture of glue rather than for food purposes, and that the prices received were too low to cover the costs of production.

Japanese production of cassava continued for local consumption, particularly in the Palikir part of Sokȩs District, and expanded markedly during the war along with the production of cassava meal or flour. The Japanese also planted in rows of hills, but they used only one stem cutting, which was stuck straight up in the top of each hill. Ponapeans have not adopted this method of planting because they believe cassava grows faster when the cuttings are placed at an angle. Japanese reports give the price of cassava on Ponape in 1937 as 40 sen per kilo.

Ponapeans remove the poison in cassava by grating and soaking the root to make a cassava starch. The method is said to have been adapted from that used for arrowroot. A piece of tin in which holes have been punched with a nail is used as a grater. The grated root is then mixed with water and squeezed in a piece of cloth over a bucket. The part remaining in the cloth is thrown away, fed to pigs, or sometimes mixed with the starch. The water is poured off the top of the bucket and the starch, which has settled to the bottom, is used. It is rolled in banana leaves and baked with hot stones, or sometimes it is dropped by the spoonful into boiling water. Baked cassava starch is like a soft, rubbery bread, and when boiled it resembles dumplings.

The starchy sediment can also be spread out in the sun and dried, giving a cassava flour that the Ponapeans regard as of a much higher quality than the type made by the Japanese. The Japanese simply ground cassava and dried it in the sun. The Japanese flour is said to spoil easily, whereas that made by soaking and squeezing lasts indefinitely, although there is greater waste and it takes longer to prepare. Several of the simple engine-driven cassava mills used by the Japanese were still left on Ponape.

A sample of cassava flour made by the Ponapean method was prepared under the direction of Chief B1 of Nȩt District. Twenty-three kilos of root yielded 4.2 kilos of flour and about five hours of working time were required, not counting the half hour spent in harvesting the cassava. Four hours were required to skin, grate, and squeeze the roots, after which the starch was allowed to soak and settle for two and a half hours. It was then dried for two days, requiring five minutes work in turning five or six times each day. At the 1946 rate of 35 cents for an eight-hour day for women, this gives about 5 cents per kilo for labor plus five and a half times the cost of fresh roots (1.5 cents per kilo). At these rates the cost of production of cassava flour is about 13 cents per kilo, but the price of cassava roots is so low that little is offered for sale and at present it is doubtful that any quantities of flour of the native type would be produced at less than 10 cents per pound. This might be reduced if labor costs could be lowered by mechanical grinding or if waste could be reduced by finding a market for the part thrown away or fed to pigs. Before the war the Japanese bought Ponapean cassava flour at 40 sen per 100 momme, a Japanese unit of weight (120.9 to the pound), or approximately 12 cents per pound.

12. Arrowroot (mȩkimȩk). Arrowroot is said to have only one variety, which was identified by Fosberg as Tacca leontopodiodes. Arrowroot is of very minor importance on Ponape. Although it is liked, it is very seldom eaten because wild taro and "Western yams" are easier to gather in most parts of the island than arrowroot is to prepare. Arrowroot is used to a certain extent by the people from Mokil and Pingelap who live on Ponape, but there are apparently many Ponapeans who have never eaten it except in the homes of out-islanders.

Most of the small amount of arrowroot that is used comes from wild plants which grow mainly on the small coral islands of the outer reef. Arrowroot is cultivated in small amounts by a few people who have farms on these islands or in some of the barren parts (mall) of the main island, such as in Section K21. In planting, seeds are generally scattered broadcast without preparation of the ground in any way. Less frequently a root is cut in half vertically so that each part has half of the stem, and each half is placed in a hole dug with a digging stick about a foot deep and a foot in diameter. Arrowroot has no animal or insect pests; even wild pigs do not bother it. Cultivation is the work of women, as is harvesting and the preparation of the starch.

Arrowroot cannot be cooked as it is dug from the ground. It must be grated, squeezed, soaked, and allowed to settle before it can be cooked. The method of preparation is similar to that described for cassava. While it is soaking, the arrowroot is stirred and the fibers are removed. The starch that settles to the bottom is moulded into a loaf which is wrapped in leaves and baked with hot stones, or it may be laid out in the sun and dried into a flour which can be used later, after water is added.

Arrowroot is used as a substitute for yams and breadfruit, but since it is seasonal and matures about the same time as yams it cannot be eaten when yams and breadfruit are scarce. This fact probably explains the unimportant place of arrowroot in the economy of Ponape today; for it is reasonable to assume that in the early days when Ponape was first settled, arrowroot was far more important, as it is in the diet of the neighboring atolls.

13. Pumpkins or squash (pwȩnkin). Four varieties of pumpkins or squash are recognized that do not have distinctive names; they are described as being (a) large and round, about 18 inches in diameter, yellow in color with a thin layer of meat or flesh; (b) small and round, about 6 inches in diameter, green in color with thick flesh; (c) long and curved, about 18 inches in length, and green in color; (d) long and curved, about 18 inches in length, but yellow in color. The last two are most popular and most widely planted.

The last three were introduced during the German period, whereas the first dates from the Spanish period.

Planting and harvesting pumpkins is the work of women. Pumpkins do not grow wild; they are planted, either from the seed or, more often, from the vine. A piece of vine about four feet long is laid in a shallow trench three feet long and about two inches deep and two inches wide, dug with a knife. The trench is filled in with dirt, leaving from about 9 to 12 inches of the vine sticking out. The vine should be about one inch under the surface, and growing vines must be shaded from the sun.

Seeds are planted above small filled-in holes about two inches deep and two inches in diameter which are laid out in rows. A small mound of loose dirt is piled over the hole and the seed is placed in this about an inch below the surface. When pumpkins are planted from seeds it is unnecessary to shade them, but rats so commonly dig up the seeds and eat them that vines are more often used. Rats are the main pest of pumpkins; chickens do not bother the seeds and there are no serious insect pests. Rats do not bother the fruit itself as they do watermelons.

Three (a, c, d) of the four varieties require artificial pollination. Without it the fruit stops growing after it has reached a length of three inches. Ponapeans speak of having to "marry" (kapwǫupwǫ̃uth) the plants. Pumpkins can be pollinated any day while the flower is in blossom, but it is believed that it must be done at sunrise (6 A.M.) in order to be successful; if it is done at eight o'clock it will not work. Each vine has both male and female flowers. The male flowers are picked and placed over the female flower so that the stamen projects into it and are tied there with grass or hibiscus or anything that is handy. Pumpkins are the only plants used by Ponapeans that require artificial pollination.

Pumpkins are planted at the beginning of the rainy season, with taro, and harvested and eaten in the fall when yams and breadfruit are scarce. Before the war only about half the families grew pumpkins. Pumpkins ranked below bananas in importance as a substitute for yams and breadfruit, but during the war they are said to have fallen below sweet potatoes and cassave. Pumpkins are either boiled or baked with hot stones. Japanese reports show 12.6 tons valued at about 1,446 yen and three hectares planted to pumpkins and squash in the Ponape Branch Bureau in 1937.

14. Turmeric (ǫ̃ng). Four varieties of turmeric are recognized, all of which date from the Native period: (a) "little turmeric" (ǫ̃ngẹtik), (b) "big turmeric" (ǫngalap), (c) Lũwarõ, and (d) Ǫ̃ngkol. Only "little turmeric" is used for food purposes, but all are cultivated for the making of dye. None is said to grow wild, though a bed of turmeric spreads once it has been planted. Both "little turmeric" and "big turmeric" were identified by Fosberg as Curcuma. Turmeric is differentiated by Ponapeans from two similar plants, Zingiber (ǫ̃ng ẹn pẹlạ) and Hedychium (sinsẹr) of which there are several varieties. As a food, turmeric is used only as a seasoning for soups made with fish, chicken, and pig, and in the making of kǫurap for baby food.

Planting and gathering turmeric is women's work. After the leaves have been trimmed off, the top of the root (mãsẹn pạk) is planted in a hole six inches deep and three inches in diameter made with a digging stick. Turmeric requires no protection from pigs or other animals, and insects do not bother it. It is used for food and dyes only during the sunny season, because during the rainy period the roots "turn to water" when the new roots sprout and become rotten (wẹl) like yams.

15. Chili pepper (sẹlẹ). Eight varieties of chili pepper, which do not have distinctive names, are recognized: (a) a small, red variety about half an inch long, which is the hottest of all; (b) a large, red variety about two inches long, almost as hot; (c) a large, red, fat variety about two inches long and an inch and a half in diameter; (d) a large, red variety about two inches long, which is "tasteless" rather than hot; (e) a large, yellow, hot variety about two inches long; (f) a small, red variety about half an inch long but thinner than (a); (g) a medium-sized, red variety about one inch long; and (h) a medium-sized, yellow variety about one inch long, also hot.

The first two varieties are the most commonly used. Variety (a), which is the best liked, grows wild all over the island and does not have to be planted; (b) does not grow wild but is planted by practically every family on Ponape. The other varieties do not grow wild and are cultivated only by the families that like their particular flavors. Variety (a), like sugar cane, is said to have been grown on Ponape in the Native period, since both are mentioned in Ponapean mythology. It is probable that pepper, sugar cane, mangoes, and cassava were introduced through contact, but it is possible that they may have reached Ponape prior to 1826 through natives from other islands who had earlier contact with the outside world. The other varieties of chili pepper were introduced in the pre-Spanish and Spanish periods.

Chili pepper is very well liked and very widely used on Ponape. It is the only vegetable food that can be used as a substitute for meat or fish, being pounded with salt into a sauce in which starch foods are dipped. At times it is also crushed in water and made into a drink. Normally chili and salt sauce is served with every meal. It may be eaten as a seasoning on yams, breadfruit, and their substitutes as well as on all protein dishes, although it is used less commonly with chicken than with pig or fish and other seafood. Only fresh pepper is used; it is never dried, but picked just before serving.

Cultivated chili pepper is grown near the house so that it will be readily available. It is planted and gathered by women. Two methods are employed in planting: young plants that have sprung up by themselves are replanted, or the seeds are sprouted in a wooden box filled with earth, transplanted to a sunny place, and covered with leaves to protect them from the sun until they begin to grow. They are not planted in rows and do not have to be protected from animals, insects, or birds. Chickens eat the wild variety but do not bother peppers that have been planted.

16. Citrus (kãrẹr). Eight varieties of citrus fruits are recognized, all of which can be referred to as kãrẹr but only four of which have distinctive names. (a) "Ponape citrus" (kãrẹr ẹn Põnipẽi), a sour orange with a skin that is green even when ripe, is plentiful in the wild state and is not cultivated. (b) "Little citrus" (kãrẹr tik), a lime, is also plentiful in the wild state and is not cultivated. (c) "Lemon" (laman) a small lemon or lime, the most plentiful of all citrus varieties, grows wild and occasionally is cultivated as well. (d) "Large citrus" or "orange" (kãrẹr lãuth, ọrẹns), an orange the skin of which turns yellow when ripe, is cultivated plentifully but does not grow wild. (e) An orange with a skin that remains green when

ripe and of which only a few cultivated trees are found, all in Kiti District where it was introduced by Henry Nānipēi, probably from the Philippines. (f) A Mandarin orange or tangerine, with many small seeds and a thin, easily peeled skin, is found in small numbers in Kiti and Matālanim districts, all cultivated; this tree was introduced in the Japanese period, and the fruit was also imported by the Japanese from Japan. (g) A pomelo (Citrus maxima), which is about eight inches in diameter and has a yellow center and a thick skin, is found in small numbers in Kiti and Matālanim districts and about the Colony. (h) A pomelo with a pink center and an even thicker skin is found in small numbers in the same regions.

The variety most often eaten is the lemon (c), which is used with salt as a flavoring for trepang, shell fish, and other seafoods. For this purpose lemons are brought home from the farm and sometimes also planted near the house. Lemon leaves are also used in making tea. The next most widely used variety is the orange (d), though this is only rarely brought home. The remaining varieties of citrus fruits are eaten only in passing, after orbetween meals.

Planting citrus fruits and gathering them for use at home is the work of women. Citrus are not planted from the seed. Small trees that have sprouted from where seeds have fallen are dug up and replanted in a small hole about two inches deep and two inches in diameter dug with a knife. They are not tied to sticks for support, but sticks are set about the new plant to keep animals from knocking it over. To increase the fertility of a citrus tree an iron rod may be driven into its trunk. Citrus trees bear most heavily during the humid months.

17. Pineapple (pwāinapạr). Three varieties of pineapple are recognized: (a) "Ponape pineapple" (pwāinapạr ẹn Pōnipēi), which was introduced in the Spanish period and has a small fruit; (b) "prickly pineapple" (pwāinapạr takatẹk), which has needles on the leaves; and (c) "nonprickly pineapple" (pwāinapạr sōtẹke), which has spineless leaves, is the best eating and was introduced in the German period. Hoshino's report identifies the "nonprickly pineapple" as "smooth Cayenne" and adds that it was introduced from Hawaii. It says that in 1928 there were less than 3,000 plants of this variety, grown mainly near the Colony and in Kiti District.

Pineapple is one of the most popular of the new foods that have been introduced since contact, every family growing from 100 to 200 plants. It is eaten only between and after meals but is brought home and kept about the house during the rainy season when it ripens. Pineapples are planted by women, who cut off the small suckers or ratoons growing out from an old plant at the ground and replant them either irregularly or in rows so that each plant is six feet from the next. The crowns of the fruit are not used in planting since these take two years to bear, whereas with the Ponapean method of planting only one year is required. Although the fruit becomes smaller and smaller each year, pineapples planted in the Ponapean method continue to bear for as long as twenty years. If the ratoons are not replanted, they spread by themselves from the mother plant.

Mr. Hoshino, of the Agricultural Experiment Station on Ponape, conducted a series of controlled tests on pineapples which are said to be comparable if not superior to experiments on pineapple that had been carried on in Hawaii. Tests running over a period of fourteen years (1924-1939) were made on varieties, planting methods, and quantities and types of fertilizer. A minimum of 1,500 roots were used for each test. The results of these experiments cannot be adequately summarized here, but several factors are worth noting. A type of pineapple suited to Ponape was developed by the South Seas Industrial Research Company by selecting and propagating seeds of native varieties (b) and (c), which was superior to both native varieties. The Japanese used ratoons or suckers more commonly than crowns in planting. The first harvest occurred 18-20 months after planting, with annual harvests thereafter. A fallow period is recommended after three harvests. The harvest season is from June to August, and the best time for planting is October to February. The average cost for the first three harvests of 400 chobu or cho (1 cho equals 2.45 acres), fertilized and planted with 20,000 seedlings per cho, was 5.08 sen or about 1-1/4 cents per pineapple.

In 1940 the South Seas Industrial Research Company, after having grown pineapples since 1924, established a small cannery in Palikir. Because of wartime restrictions canning was only on a small scale and informants say that most of the pineapples, and the mangoes and breadfruit that they also canned, were purchased from Ponapeans. Mr. Hoshino, however, was optimistic about the future of commercial pineapple production on Ponape after the war, stating in his report that "peace will surely see a spreading interest in the growth of pineapple on Ponape" and "this crop should occupy a most important position in the future." Japanese records show a production of 8.5 tons, valued at about 1,300 yen and 14 hectares planted to pineapples in the Ponape Branch Bureau in 1937.

18. Papaya (mọmiap). Two varieties of papaya that do not have distinctive names are recognized. One variety has fruit of average size and a dark green leaf stem; the other has a large fruit more than a foot in length and a reddish leaf stem. Papaya, whose Ponapean name comes from the English "Mommy apple," was first introduced in the Spanish period by an American. It is said to be the only plant on Ponape that has "male" (mọmiapạr-mān) plants, which are fruitless, and "female" (mọmiapạr-li) plants, which bear fruit.

Papaya is never cultivated since it grows wild all over the island in both good and bad soil. It is said that it is only necessary to clean and burn the land for any reason and papaya trees spring up all over by themselves. Small papaya plants are destroyed by both pigs and cows, which eat their leaves, and cows frequently knock down large papaya trees to get at leaves that are out of reach, but there is no need to protect papaya plants since they grow so readily. Papaya fruits are sometimes used as chicken feed. Papaya is well liked both because it is plentiful and requires no work and because of its flavor. In season throughout the year, it is picked and brought home by women and eaten only between and after meals. Japanese records show the production of 94.3 tons valued at about 4,070 yen, and 18 hectares planted to papayas in the Ponape Branch Bureau in 1937.

19. Mango (kāngith). Four varieties of mangoes, including one that is presumably durian, are recognized: (a) "Ponape mangoes" (kāngith ẹn Pōnipēi), which are small and dark green in color, are said to date from the Native period, but, like chili pepper, this variety was probably introduced through contact; (b) "Salong mangoes" (kāngith ẹn Salong), which are large and light green in color, are named for a farmstead in Matālanim District where this variety was

introduced by Mr. Doane, an American missionary; (c) "Changed mangoes" (kiçwçk çn kängith çn Salong), which are small and light green in color, are a local variant that appeared after variety (b) had been introduced; and (d) durian (türion), which are very large, about 12 inches in diameter, have a very thick copper-colored skin without prickles, yellow flesh, and many seeds.

Most families have one or two cultivated mango trees about the house, but most of the mangoes eaten grow wild. Wild mango trees are not found in the mountains, but only along the edge of the farm belt where they have sprouted from discarded seeds. Large mango trees, both cultivated and wild, often mark the sites of former houses and public buildings, and mango trees were planted for shade along some of the streets of the Colony.

Planting is generally done by men at any time of year, but a person rarely planted more than one tree during his lifetime. A small mango that has started to grow where it has fallen is dug up and replanted in a hole about six inches deep and six inches in diameter, dug with a digging stick. Young mangoes are not damaged by pigs, cows, or other animals, so that it is not necessary to protect them or even to tie them to a stick for support. The fruit is eaten on the tree by all fruit-eating birds but nothing is done to prevent this. Insects do not damage mango trees, but the fruits that have fallen to the ground cannot be eaten because they are full of worms which grow from eggs laid in them by insects.

Mango trees bear seasonally; some varieties ripen about July, others later. They are picked from the low hanging branches by women, or from the higher branches by men, and carried home to ripen, but they are eaten only between and after meals.

Mangoes purchased from Ponapeans were canned in small quantities during the war by the South Seas Industrial Research Company. Japanese records show a production of 0.2 tons valued at 19 yen, and 1 hectare planted to mangoes in the Ponape Branch Bureau in 1937, but these figures seem too low to include the scattered trees owned by natives.

20. Guava (guäpa). One variety of guava is recognized. Guavas are not cultivated but have grown wild on Ponape since their introduction in the Spanish period. The trees bear during the humid season when the ripe fruit is picked and eaten in passing. Fruit is gathered by women, who are permitted to climb the guava tree as well as to pick fruit from the lower branches.

21. Soursop (säi). One variety of soursop, which was introduced in the Pre-Spanish period, is recognized. Soursop is not cultivated, but many trees grow wild in the farms. Soursop trees spring up by themselves and when farms are cleared most are cut down as weeds, leaving only enough to satisfy the needs of the family. Several birds (sïçk, çrç and pwïlïçt) eat the fruit, but it is not considered necessary to do anything about it. The red fly, which eats breadfruit, also bores into the fruit of soursop, and the coconut "worm" is said to have killed a number of soursop trees. Soursop ripens in the humid season. It is gathered by women who pick it from the lower branches or climb into the tree and pull off the fruit with their flower pickers. The fruit is generally eaten in passing, and even if it is carried home it is eaten only between and after meals.

22. Mountain apple (apçl, päniap). Two varieties of mountain apple are recognized, both of which are known as "apple" (apçl) or by the Ponapean name "Yap frond" (päniap). It is believed that the mountain apple was introduced into Ponape from Yap a very long time ago during the Native period. It grows wild and a few people plant it. Small trees that have just sprouted from seeds are dug up by women and replanted. Young trees are protected by coconut-leaf fences to keep pigs from knocking them down accidentally, but animals do not eat them. Insects spoil the fruit when it has ripened, and a few trees have been attacked by the coconut "worm." The fruit ripens during the humid season, when it is gathered from the ground by men, women, and children and eaten raw in passing.

23. Malay apple (kirçk çn wal). One variety is recognized of a fruit identified by Christian as "Jamboo or Malay apple." This grows wild and is never cultivated. During the humid season it bears a small round red fruit about three quarters of an inch in diameter, which is picked and eaten raw in passing by men, women, and children.

24. Pandanus (kipär, thäipw). Five varieties of pandanus were recorded that are classed together as what is known as kipär in Kiti and Matälanim districts and as thäipw in Ü and Nçt. These are distinguished from another class of pandanus known as mwathal that bears no edible fruit. Varieties (a) and (b) were both identified by Fosberg as Pandanus.

(a) Kipär çn wal, thäipw çn wal, a very short tree only occasionally bearing small, hard fruit (six inches long) with small "keys" or "cones";[5] it is not cultivated or eaten.

(b) Kipäritik, thäipwçtik, which bears medium-sized fruit (12 inches long) with long narrow "cones"; it grows wild on the small islands or the outer reef and occasionally in the coastal belt and mountains, and is sometimes planted.

(c) Kipäranai, thäipwanai, which bears large fruit (18 inches long) with large "cones"; it is cultivated only.

(d) Laspwçrik, which bears a very large fruit (24 inches) with large "cones" (8 inches long) the points of which are very sweet; it was introduced from the Marshalls in the Pre-Spanish period but does not grow wild; there are only a few trees on Ponape, some ten or twenty being found in Matälanim District.

(e) (Name unrecorded), which bears a medium-sized fruit (12 inches long) with medium size "cones" (4 inches long); it is lighter green in color than the other varieties; it does not grow wild, but some are cultivated on the small islands.

Although there are no animals or insects that bother pandanus, it does not grow well on Ponape, except for variety (a), which grows in the barren places (mall) and is neither eaten nor used in handicraft. Pandanus grows best in sandy soil, which is found on the small islands of the outer reefs, but is rare on the main island even along the edge of the lagoon. It is said that variety (d) dies if it is planted in ordinary soil. Variety (a), which is the commonest, has no uses, and is cut down when the farmstead is being cleared. Most of the pandanus eaten comes from cultivated plants. In order of preference for eating purposes, the varieties

[5]The tapering segments of a pandanus fruit (syncarp) are variously called phalanges or fibrous drupes by botanists.

rank as follows: (d), (e), (c), and (b). All of these are chewed raw like sugar cane, only in passing. Varieties (d) and (e) are also taken home and baked in hot stones, but even then they are not served as a part of the meal.

Pandanus ripens during the humid season along with breadfruit but can be planted at any time of year. Planting and harvesting are men's work. A terminal bud is cut from a branch and planted at the bottom of a hole, dug with a digging stick, about a foot and a half deep and foot in diameter, after which it is covered with earth. Seeds are not planted, because it is said that they take as much as a year or two to grow, and the other method is much quicker.

25. Sugar cane (sẽu). Six varieties of sugar cane are recognized: (a) "western cane" (sẽun air), which came from some place in the west; (b) "foreign cane" (sẽun wai), which was introduced from an unknown source; (c) "blood cane" (sẽu ñta), which has a reddish skin and reddish center; (d) "light cane" (sẽu pwẹt), which is light green in color; (e) "dark Palau cane" (sẽun Pälau tontọl), which has a reddish and grayish stalk with a white center; and (f) "light Palau cane" (sẽun Pälau pwẹtẹpwẹt), which has a light yellow-green stalk.

"Western cane" is believed by Ponapeans to have been grown on Ponape in the Native period, but, again like chili pepper, it was probably introduced through contact. Varieties (b), (c), and (d) are all said to have been introduced in the Pre-Spanish period. Varieties (e) and (f) were introduced in the Japanese period and grown on the Kohatsu Sugar Plantation in Matälanim. After the Japanese evacuation some of these plants were taken by Ponapeans, who grew them in small quantities. Other varieties were grown on Ponape by the Germans, but they have not been given Ponapean names and it is doubtful whether any have survived.

Sugar cane is well liked on Ponape, but it is eaten only in small quantities after or between meals. It is regarded more as a drink, like coconuts, than as a food. In the German period and earlier, one or two families made molasses by pounding the cane, and squeezing it like kava in hibiscus bast. Molasses is poured over bananas or baked and sliced Cyrtosperma and then baked in a tin pan in the hot stone oven; this dish, learned from the people of Mokil and Pingelap, is used by very few Ponapean families. Sugar cane is not used as either pig or cattle feed, though pigs eat the pulp that is thrown away after sugar cane has been chewed.

Almost every family has fifty or so stalks of sugar cane, which are generally planted near the house so that they are close at hand for anyone who wished to eat them; no sugar cane grows wild. Sugar cane can be planted at any season and it bears throughout the year, maturing in about five months. Its cultivation is the work of women. A hole one foot deep and about nine inches in diameter is made by driving the digging stick into the ground and wiggling it around to loosen the dirt. About three feet are cut off the top end of the cane and two such pieces are stuck into the hole at an angle, with the end set at the bottom of the hole. Less frequently a whole plant is transplanted. Sugar cane must be protected from pigs by coconut leaf fences built around the plantings. To make it grow well it is transplanted to new soil.

The Japanese planted sugar cane differently, first plowing the field with carabao, and then cutting the cane into eight-inch lengths, which were laid flat on the ground and covered with about an inch of loose dirt. The Ponapeans have retained their old methods of planting, and continue to grow sugar cane in scattered clumps rather than in rows laid out regularly in fields. Japanese records show the production of 50 tons valued at 200 yen, and 1 hectare planted to sugar cane in the Ponape Branch Bureau in 1937.

The commercial cultivation of sugar cane on a large scale was undertaken when Kohatsu converted its plantation in Matälanim District to sugar cane immediately following the harvest of the 1937 cassava crop. Sugar cane was planted in 1938 and the following year a sugar factory and distillery, the largest and most modern industrial establishments on Ponape, were erected and a narrow gauge railway with gasoline engines and steel flat cars was installed. During the war alcohol was exported to Japan where it is reported to have been used as fuel for automobiles. Japanese records show the export of 20,563 yen worth of "drugs and chemicals" from the Ponape Branch Bureau in 1940; this category includes "alcohol" and "others," and it is assumed that alcohol accounted for the total amount although this is not clear from the published tables. Production of sugar cane and alcohol for export was abandoned as the submarine blockade isolated Ponape, but a small-scale production of molasses and of a distilled liquor known as Shochu (sõsu) continued for local consumption. Japanese reports give the price of molasses on Ponape in 1937 as 32 sen per kilo.

After the war only the steel skeleton of the factory buildings and the heavier items like crushers, motors, and tanks were left, and these lay rusting. The story of what happened to the factory varies from its destruction through native vandalism to the shipment of the equipment to Saipan. Neither of these explanations seems to account for the actual state of affairs. The evidence seems to point to the deliberate destruction of equipment by the Japanese when surrender became inevitable, with the gear boxes of crushers and motors opened to rust in the rain. Earlier, a part of the plant had been partially dismantled by the removal of any items that could be used elsewhere on the island, after the export of alcohol had been stopped. Some of the sheet metal went to roof military barracks and a generator was taken to furnish electricity for the nearby military garrison. The factory was machine-gunned by American planes on at least one occasion, and bomb craters could be seen nearby. The damage to the plant was light, however, and the attack may have occurred after the plant had been partially dismantled. Most of the fields were empty, though sugar cane was still growing in a small area.

A small molasses factory was operated by Äuntholẹnririn of Matälanim District under Military Government license, and he had requested permission to produce sõsu with a small still that also survived.

26. (Sẽu alẹk). One variety is recognized of a plant which resembles both sugar cane (sẽu) and "sword grass" or Miscanthus (alẹk), from both of which it takes its name. It was introduced in the Pre-Spanish period but now grows wild along the banks of freshwater streams and rivers in the mountains. It is chewed in passing like sugar cane by men, women, and children, but is not taken home and is never cultivated.

27. Watermelon (wäsmẹlẹn). Three varieties of watermelons are recognized: (a) "watermelon" (wäsmẹlẹn), which is large, elongated in shape, and has green skin, red flesh, and black seeds, was introduced in the Spanish period and is the commonest; (b) "tiny watermelon" (kisin wäsmẹlẹn) or "watermelon" (wäs-

mẹlẹn), which is smaller, round, and has green skin, yellow flesh, and black seeds, was introduced in the Japanese period; and (c) "melon" (mẹlẹn) or "watermelon" (wäsmẹlẹn), which is elongated and very small, about three inches long and an inch and a half in diameter, and has green skin, red meat, and white seeds, was introduced later in the Japanese period.

Watermelons grow well and are very well liked, but they are cultivated by fewer than half the families of Ponape. They are eaten only after and between meals. None grows wild; they are planted and harvested by women at any time of year. The seeds are planted in small holes about two inches deep and two inches in diameter, dug with knives; the holes are not laid out in orws. Rats "smell" and eat the seeds as they do pumpkin seeds, and in addition they eat the fruit unless it is protected. When the melon is still only about an inch in size, a large hole is dug in the ground and the melon is laid in it. The hole is covered with sticks and a pile of dirt is made over this so that the rats cannot "smell" the melon. There is no protection for the seeds against rats, however. Japanese reports for the Ponape Branch Bureau in 1937 show a production of 22.8 tons valued at about 2,707 yen, and 5 hectares planted to watermelon; 4.8 tons valued at about 529 yen from one hectare of casaba melons; and 1.0 tons valued at about 166 yen from one hectare of cantaloupe.

28. (Kiṣẹtikimäi). A bush of one variety is recognized bearing small, round, sweet berries a half inch or less in diameter, which burst open when they are ripe. The berries are a very dark reddish purple, about the color of a blackberry. Their flavor is liked, but not the fact that they stain the teeth. They are eaten raw in passing by men, women, and children during the rainy season. The plant grows wild in the mountains and on the farms, but is never cultivated and is cut down when the farms are being cleared.

29. Cacao (kạkao). One variety of cocoa or cacao, which was introduced by American missionaries in the Spanish period, is recognized. There are about ten or twenty native-owned cacao trees on Ponape, all in the Wạnẹ part of Kiti District. None has been planted since the Spanish period, and no beans have been sold or exported. Ponapeans know nothing about the fermentation of cacao beans or the making of cacao or chocolate, and cacao in the native economy is an unimportant form of fresh fruit. The ripe pods are broken open; and the juicy, white, pulp is sucked off the beans; but the beans themselves are spit out. The trees originally were planted by men, and fruit is now picked and eaten only in passing by men, women, and children.

About fifty trees of several varieties of cacao were growing on the grounds of the Experimental Agricultural Station, indicating that the Japanese at least considered the commercial possibilities of raising cacao. For several reasons these possibilities are worth exploring. Cacao is a crop that requires little attention and that has been produced successfully on native-owned and native-managed farms. It grows in areas comparable to Ponape; in the Gold Coast (now Ghana), the largest cacao-producing country in the world, the main cacao areas are between 6^{o} and 7^{o} north of the equator and have a comparable range of temperature and a rainfall of 50 to 60 inches a year. There are large areas of unoccupied and unused land in the interior of the island. Although cacao prices have been subject to violent fluctuations in the past, a market in America could be assured since the United States is the largest consumer and must depend entirely on foreign countries for its supplies. An obvious recommendation is that a specialist familiar with cacao and its diseases should be recruited to inspect the trees on the Experimental Station and on the native farms, to run some tests on fermentation to determine the quality of cacao that can be produced and, if the tests are favorable, to outline a program for teaching the Ponapeans how to plant cacao and ferment the beans.

In June 1946 the few native-owned trees that were inspected were bare of fruit, whereas those on the Experimental Station, particularly those of the only labeled variety, "Theobroma cacao, Linn. (Var.), Cacao foresterio foresterio, introduced in 1927," had a great many pods, many of which were black. Although black pods may indicate disease, their presence on these trees does not necessarily rule out commercial possibilities, since the pods had in all probability hung on the trees for six months or more after they should have been harvested. The season when cacao matures on Ponape is not known, but in Ghana the main crop is harvested in the early part of the dry season, from about October through December.

30. Green onions (ạ̈niạn, ningi). Two varieties of green onions are recognized that do not have distinctive names, but are known by either the English or the Japanese word for onion. One variety is about 15 inches long, whereas the other is smaller and has grasslike leaves. Both the Germans and the Ponapeans tried to grow a Spanish-type of onion with a large bulb and failed, but green onions grow well and, except for snails, are free from animal and insect pests.

Green onions are very well liked by all Ponapeans, but they are not cultivated by all families and do not grow wild. A number of natives, particularly in Kiti District and near the Colony, grow green onions, and supply them in small quantities to others in return for yams or chickens. Green onions are eaten raw between and after meals and are planted near the house so they will be readily available. They are planted by both men and women at any time of year and are picked and eaten as they are needed. The method of planting was learned from the Japanese. A mound of loosened earth about four feet long, nine inches wide, and six inches deep is prepared, and green onions, divided into the separate stalks, are planted two inches deep and six inches apart in the mound. Japanese reports show a production of 0.5 tons valued at about 199 yen and one hectare planted to onions in the Ponape Branch Bureau in 1937. They also give the price of green onions on Ponape in 1937 as 40 sen per kilo.

31. Corn (kōn). Three varieties of corn are recognized: (a) "yellow corn" (kōn ọngọng), which has yellow kernels; (b) "white corn" (kōn pwẹtẹpwẹt), which has white kernels; and (c) a variety known only as "corn" (kōn), with black and white kernels. Corn was introduced in the Spanish period and is always cultivated. It is planted by women at the beginning of the trade winds and harvested during the humid months. Small holes about two inches deep, two inches in diameter, and two feet apart are made with a knife and two kernels are dropped in each hole and covered with dirt. From two to five ears of corn are expected from each pair of seeds. Cutworms (mwṣ̆athi) eat the young leaves of corn and have to be picked off the young plants twice a week, but they cause less damage to corn than they do to tobacco and wet rice. The young plants must be shaded from the sun, and unless cows are kept out, they destroy corn; rats sometimes climb

the stalks and eat the kernels, but pigs do not bother corn. Corn is not used as pig feed, and no uses are made of stalks or other parts of the plant.

Corn is brought home from the farm and cooked by boiling or by baking among hot stones. It is served at the same time as yams or breadfruit, but is eaten after them. Although it is served with the meal and eaten while people are still seated, it is thought of as in the same category as papaya or mountain apple. It is not considered as a real food, and it is never used as a substitute for the starch or the protein courses. Only a few Ponapeans bother to grow corn, although it is liked. Many go to others who grow corn when they wish to eat it, and before the war it could be bought from the Japanese. Japanese reports show a production of 2.7 tons valued at 275 yen and three hectares planted to corn in the Ponape Branch Bureau in 1937.

32. Inocarpus or Polynesian chestnut (mąrąpw). Two varieites of Inocarpus were recorded, both of which are called by the same name. One is described as having a thin shell and the other, which was identified by Fosberg as Inocarpus fagifera, is thick shelled. The nuts of both varieties are eaten raw after they have fallen to the ground by men, women, and children in passing. They are sometimes gathered by women and taken home to be eaten between meals after having been baked in hot stones or boiled. The trees are seasonal, bearing nuts in October and November, so that the nut is eaten mainly during the fall lean season, but not as a yam or breadfruit substitute. The trees grow wild in the farming area along the shore, and are never cultivated.

33. Terminalia or "Indian Almond" (thipwǫpw). One variety of "Indian almond" is recognized, which was identified by Fosberg as Terminalia catappa. It grows wild on the small islands of the outer reef and in the few sandy places on the beach of Ponape proper. It is never cultivated by Ponapeans, but the Germans planted a number as shade trees. During the rainy season it bears nuts which are gathered from the ground by men, women, or children in passing and eaten raw, after the shells have been removed.

34. Kathai palm (kathai). One variety of kathai palm is recognized that grows wild in the mountains in the interior of the island. Both the kathai and kotopw palm are described as resembling the Areca palm (pū), but they differ at least to the extent that their nuts do not have the intoxicating effect of the betel nut. When they are small and green, nuts of the kathai palm are gathered by men and eaten in passing after the fibrous husk has been removed; they are said to be chewy and tasteless. The nuts are not taken home and the kathai palm is not cultivated. Although it is believed to be edible, the cabbage of the kathai palm is not used.

35. Kotopw palm (kotopw). One variety of the kotopw palm, which resembles both the Areca palm and the kathai palm, is recognized. Like the latter it grows wild in the mountains. The nuts of the kotopw palm are not eaten, but its cabbage (kopw, kopwin, kotopw) is eaten in passing by men who are hunting in the interior of the island. It is never cultivated and the cabbage is not taken home.

36. Wild yams (palāi). Two varieties of a type of wild yam are differentiated from both yams and "Western yams" although the similarities are recognized. These are (a) palāi, which has yellowish flesh, and (b) weitǫl, which has reddish flesh. The former was identified by Fosberg as Dioscorea bulbifers. Palāi has single globular roots up to about eight inches in diameter; and, like certain varieties of yams, it has fruit or vine seeds about four inches in diameter, which are not eaten. In the mythological period long before contact, it is said that palāi roots were one of the main foods used for the starch course. Today, however, palāi is used principally as a diet for invalids. A few individuals who like it eat it occasionally between or after meals, but it is not used as a substitute for yams or breadfruit.

Palāi is so "sour" that it cannot be eaten without having been prepared by a process which takes from two to four days to complete. The roots are first left overnight to bake in a hot-stone oven, after which the skin is peeled off and the meat is crumbled by hand into a special basket (pwātęn palāi) lined with ferns, which takes four or five women a day to prepare. It is kneaded occasionally while it stands for a day or so under a stream of fresh water running out of a bamboo trough. When the sourness has been carried away by the water and the doughlike substance tastes all right, it can be eaten as it is. What is left over is wrapped in breadfruit leaves and rebaked in the hot-stone oven so that it will not spoil. Palāi prepared in this manner is described as very, very "cool," "like ice." Because of this it is well liked by people who are sick; it is food for invalids and not medicine or a cure for sickness.

Palāi grows wild on the main island, both in the mountains and about farms, but it does not grow on the small islands of the outer reef. It is never cultivated, but is found in large numbers, and it grows so rapidly that it is one of the plant pests, particularly on coconut plantations where the vines grow to the top of the trees and have to be cut down regularly. The gathering and preparation of palāi is the work of women. Wild pigs eat both the roots and the vine seeds of palāi, but domesticated pigs do not like either, and palāi is not used as pig feed.

37. A small unidentified fruit or berry is used in the making of baby food (kǫurap).

38. Ipomoea (ōmp). Two varieties of a vine identified by Fosberg as Ipomoea gracilis are recognized, both of which are known by the same name. One has a small solid vine about the thickness of a match, the leaves of which are eaten raw or used in cooking. The leaves are gathered by women and rubbed into a ball between the palms of the hands, which softens them and makes them darker, and the balls are chewed with salt and pepper. Occasionally the leaves are eaten in passing without salt and pepper. The leaves are also added to "fish pot" when this is cooked.

The second kind has longer leaves and a larger hollow vine, the ends of which are sometimes fried with the small leaves or added to "fish pot," but are not eaten raw. The use of the second variety is new, having been learned from the Japanese, though both varieties of Ipomoea are said to date from the Native period. Ipomoea grows wild and is never cultivated; it is in fact one of the chief plant pests which must be cleared from the farm.

39. Caesalpinia (semutha). One variety of a tree with bright orange and yellow blossoms is recognized which was identified by Fosberg as Caesalpinia pulcherrima. It was introduced in the Spanish period, and is both cultivated and wild in the farm region. During the rainy season it bears a kind of bean, which is eaten raw in passing by men and women, but mainly by children. Women plant it for its flowers, placing a seed in a hole about two inches deep and two inches in diameter,

dug with a knife, and covering it over with dirt.

40. Cucumbers (kyūri). Two varieties of cucumbers are recognized: (a) "dark cucumber" (kyūri tontol), which is about 12 inches long and 2 inches in diameter, with dark green skin; and (b) "light cucumber" (kyūri pwetepwet), which is about the same length but a little thicker and with light green skin.

Cucumbers were grown on Ponape by the Germans, but it was not until the Japanese period that a few Ponapean families began to plant them. The Ponapean name is taken from the Japanese. They had been eaten previously when they were found growing in abandoned German or Japanese farms and they are very well liked. Cucumbers are not taken home, but are eaten raw in passing between or after meals. Planting is the work of women. Seeds are dropped into small holes two inches deep and two inches in diameter made with a knife and covered with earth. Cucumbers are not planted in rows and vines are not shaded from the sun; vine cuttings are never used in planting. Cucumbers grow well on Ponape and are not bothered either by animals or by insects. Japanese reports show a production of 32 tons valued at about 3,670 yen, and eight hectares planted to cucumbers in the Ponape Branch Bureau in 1937.

41. Beans (pīns). Three varieties of beans, which do not have distinctive names, are recognized: (a) white beans, which grow on a vine; (b) reddish brown beans, which grow on a vine; and (c) reddish brown beans, which grow on a grasslike plant. Beans were grown in small quantities by the Germans, and large quantities were grown by the Japanese during the war. It was not until late in the Japanese period that a few Ponapean families began to cultivate them, although beans were known and well liked. Beans growing in abandoned Japanese farms were eaten, and canned beans were bought in the stores before the war. The kind now used is variety (a); it is eaten raw, pods and all, between or after meals and is not taken home.

The method of planting was learned from the Japanese. Parallel mounds of earth about four feet long are made by loosening the dirt with a digging stick and then forming it with the hands. In this the seeds are planted about two feet apart, and over each planting pairs of sticks are joined to which the vines are trained. When the vines firtst sprout they are protected from the sun with leaves. Beans grow well on Ponape with very little attention. They are not bothered by pigs, cows, or other animals, but cutworms must be picked off or the young plants will be destroyed.

42. Eggplant (wāntūka tontol). One variety of eggplant, which has no specific name but is known simply as "dark vegetable," is recognized. Eggplant was introduced in the Japanese period but only recently has been cultivated by Ponapeans, although it is liked. Many Mortlock Islanders and some Ponapeans in Matālanim have been gathering eggplants and replanting them on their own land, and others simply have been gathering and eating the fruit growing in the bandoned fields. Eggplant is eaten raw or after boiling and frying, but is eaten only between or after meals. Planting is the work of women. Japanese plants are replanted in rows about three feet apart in holes about nine inches deep and six inches in diameter with a mound of earth on top. The Japanese method of planting cuttings from the stems and branches has not yet been adopted. Eggplant can be planted at any time of year and is said to bear fruit regardless of the season. Neither animals nor insects bother it. Japanese reports show a production of 11.2 tons valued at about 1,637 yen, and five hectares planted to eggplant in the Ponape Branch Bureau in 1937.

43. Coffee (kopi). One variety of coffee, which was introduced in the Spanish period, is recognized. Coffee is grown only in Section K19 where about ten women have from ten to fifty trees each. No trees have been planted by Ponapeans since the Spanish period. During the German period, coffee was roasted and sold to the Germans, and Ponapeans themselves acquired a taste for coffee. Although there was no market for their coffee in the Japanese period, the women continued to make their own coffee even when it was on sale in the stores. Coffee originally was planted from seeds, but later young sprouts from fallen seeds were replanted. Planting, harvesting, and roasting are women's work.

There was a small Japanese coffee plantation in Palikir and the trees were still bearing. It is understood that Ponape's entire production was consumed locally and that coffee has never been exported. Japanese records show the production of 0.2 tons valued at 125 yen and three hectares planted to coffee in the Ponape Branch bureau in 1937.

44. Kava (sokō). Two varieties of kava (Piper methysticum) are recognized: "spotted branch" (rā mwangel) and "smooth branch" (rā matal). Both are said to date from the Native period, but the former is better liked because it is stronger. Kava does not grow wild but occasionally abandoned plantings are found that have kept alive for some years. Cultivation is the work of men. Kava is planted in holes about eight inches deep and six inches in diameter, dug with digging sticks. As in the planting of sugar cane, two cuttings of the stem about a foot long are set at an angle into the bottom of the hole. Kava grows best when planted at the beginning of the rainy season, on dry land near fresh water, and it is planted both in the farmsteads and on the mountain farms. The plants are eaten by rats, against which there is no real protection. A man tries to conceal the amount of kava which he has planted, as he does with yams and pit breadfruit.

To prepare kava for drinking the roots are pounded on large flat stones (pāitel), as large as six feet in diameter, which are chosen for their bell-like tone when beaten. These are set on coconut husks so that their sound can be heard throughout the section. To honor a guest, the entire plant is pulled up and brought in to the feast house, where the stalks and leaves are cut off and thrown away. The dirt in the roots is knocked off, and the roots are broken off the stem and put on the stone slab, which has been carefully cleaned. One or more men then pound the roots against the slab with rocks, keeping a rhythm; this indicates that kava is being prepared and that the people in the section are welcome to come and share it. Leaves are laid about the edge of the stone so that pieces that fall off the slab are not dirtied by falling on the ground and can be put back on the slab.

As the kava is pounded, small amounts of water are added, and occasionally the mass is squeezed by hand to test its consistency. When it is of the right thickness, some of the pulp is laid out on hibiscus bast, which is wound around it in a special manner; the juice is then squeezed out as if a towel were being wrung out, in a method like that used to prepare coconut milk. Making kava is difficult work, and on one occasion a man so engaged inquired if there were any

machines in America which could be used to make kava. The answer, which came in jest from one of the chiefs was "You are the machine."

Kava is served in coconut shell cups with great formality and in strict accordance with rank. The highest chief receives the first sip, and it is passed four times to all the chiefs before the commoners can drink. Those who are prevented by religious convictions from drinking kava cannot leave a feast until the chief's have had their four rounds of drinks. The kava makers continue to pound the roots and add more water, until the liquid becomes very thin and weak and new plants must be brought in. Only a little is drunk at a time, but the cup is continually being passed among the group by the chief's stewards.

45. Tobacco (tąbakąr). Two varieties of tobacco are recognized: (a) "tobacco" (tąbakąr), which was introduced in the Pre-Spanish period and has short, broad leaves; and (b) "Saipan tobacco" (tąbakąr ęn Saipăn), which was introduced in the Japanese period and has longer, narrower leaves. Although the growing of tobacco was abandoned before the war by all except the older people, who did not like the milder imported cigarettes, it was revived because of wartime and postwar shortages.

Tobacco growing is primarily women's work, but the men clear the fields and help the women prepare the beds. A bed about two by six feet in size in a good piece of land near the house is prepared by loosening the ground to a depth of four inches and smoothing out the earth. All grass is cleared for twelve feet on all sides of the bed. The seeds are scattered broadcast over the bed by bending and wiggling tops of dried plants so that the seeds fall out. The bed is fenced in and covered with coconut leaves or with long carrying baskets (lăpin kiam) to protect them from the rain; these are removed when it is not raining. After about four days the sprouts appear, and by the end of about a week they are three inches tall. At this time they are transplanted to holes about six inches deep and six inches in diameter, laid out in rows two feet apart in the farmstead. The roots are stuck about an inch below the surface and the earth is packed closely about them so that the plants do not fall over. Less commonly, tobacco seeds are first planted in flats or boxes kept on the porch out of the rain, from which they are transplanted directly into the individual holes.

When the plants are about six inches tall, mounds three inches high are formed about the base of each plant, and the earth in these mounds is replaced with fresh earth each day to make the leaves thick. This is continued until the plants are about three feet tall. When they have reached five feet the top end is cut off so that the leaves will become thicker and longer. Throughout their growth tobacco plants are especially subject to attacks by the same cutworm (mwĕţathi) that also attacks wet rice and, to a lesser extent, corn and beans. These have to be picked off the first thing each morning, and they can be collected by the hundreds or thousands. Because of the worms and the mounds that are changed daily, tobacco is one of the most laborious crops grown on Ponape.

In harvesting tobacco, one leaf is picked from each plant each day, starting with the bottom outside leaves. Tobacco is cured in two ways. The best way is an imitation of the "niggerheads" bought from the whalers. The tobacco is hung for four days and then ten or more leaves are rolled together and wrapped as tightly as possible with sennit. In this form (pithipith) it will keep for about a year without spoiling, and when unwound there is a brown plug of tobacco the shape of a large cigar, from about half an inch to an inch thick and from six to nine inches long. This is then shredded for use. The quicker way is to shred the green leaves and dry them in the sun; tobacco prepared in this way is called kąrąng. Shortly before 1937 the Japanese started growing the same two varieties of tobacco on Ponape in fields about twenty hectares in size, located in the Colony, in Palikir, and in Kiti District. During the war cigarettes were manufactured locally for issue to the Japanese Navy but not for sale to civilians. These are said to have been neatly cut and rolled and packed in paper packages of fifty. Tobacco has never been exported, but has been an important import item.

HISTORICAL SUMMARY OF AGRICULTURE

A number of plants used in the Native period were presumably brought to Ponape when it was first settled or shortly thereafter, when we may assume that the economy was more like that of the atolls than it is today. It is of course possible that the first settlers came from other volcanic islands rather than from atolls, and there are clearly valid reasons for not accepting at face value Ponapean legends or statements about the periods when plants were introduced. In the absence of documentary evidence, however, these verbal traditions suggest that the early economy was based more heavily on foods of importance to the atolls than to Ponape today.

According to legends the earliest food on Ponape was Morinda citrifolia, which is no longer eaten today. Alocasia, the second oldest food, is still important, probably more so than on the atolls. This is also true of Cyrtosperma, which thrives in Ponape's fresh-water marshes, and is one of five new foods that were added when the third voyage of early settlers reached Ponape. Of these, wild yams are now of minor importance on Ponape and Ficus tinctoria is no longer eaten. Taro still has importance, but far less than on the atolls. Arrowroot, another atoll food, is of little importance on Ponape. Of these seven early foods, the three that are of significance on Ponape today (Alocasia, Cyrtosperma, and taro) are important primarily as substitutes for the two main staples (breadfruit and yams), which along with two other important substitutes ("Western yams" and bananas) are not mentioned at this period. Unmentioned also are coconuts, kava, pandanus, turmeric, and some minor foods, all of which are ascribed to the Native period but which are of little importance in Ponapean subsistence at present.

If we accept tentatively both the evidence of verbal traditions and the assumption that Ponape's economy initially derived from one of an atoll type, we may try to make a tentative reconstruction of the changes in agriculture that occurred after the period of settlement and during the postcontact periods when new plants were introduced.

Breadfruit is far more important on Ponape than on the atolls, as it is on other volcanic islands as well, and it has become the primary subsistence crop on Ponape. Yams, which are so important in the prestige economy, have also assumed an important place in the subsistence economy as the main staple food in the period between breadfruit harvests. Wild yams, ascribed to the third voyage to Ponape, are used as a diet for

invalids and are still raised as food by some who like them, but are not considered acceptable as a substitute for yams and breadfruit. "Western yams" rank second as a substitute for these two main staples; they can be harvested during both lean periods, in the fall and in the spring, because they have no season.

Two early foods are still important because they have no season and are available during both lean seasons as substitutes for yams and breadfruit, Alocasia, which ranks first, and Cyrtosperma, which ranks third. The former is considered the second oldest food plant, and the latter came on the third voyage. Both probably grow better and are more important on Ponape than on the atolls.

Taro, which also came with the third voyage, is usually planted so that it can be harvested in the fall between the harvests of breadfruit and yams. It ranks fourth as a substitute for these two staples, but it is far less important on Ponape than it is on the atolls.

Bananas rank sixth as a starchy substitute. Two varieties that are mentioned in other legends bear fruit between the yam and the breadfruit harvests, and many of the varieties that were important before the root borer appeared bear throughout the year.

Arrowroot and pandanus, which are important on the atolls, are now of little significance in the Ponapean economy. Arrowroot, the last food associated with the third voyage, ranks tenth as a substitute for yams and breadfruit, being the least frequently used of all. Pandanus is eaten only in passing.

Coconuts are important commercially, but have declined in importance in the subsistence economy because there are ample supplies of drinking water and of other foods. Kava is still very important in social life, if not in subsistence; despite its wide distribution in the Pacific, kava is the only plant to which Ponapeans ascribe a local origin, believing that it was discovered on the island during the native period.

Turmeric is used only in seasoning food and as a dye, of a color that is now considered old-fashioned. Mountain apple, which is said to have been introduced from Yap during the native period, and Ipomea are of minor importance.

A number of wild plants, which are never cultivated, presumably were either introduced during this period or were found growing wild on Ponape. These include Malay apple, an unidentified berry (28), Polynesian chestnut, Indian almond, two palms (34, 35) which resemble Areca, and another unidentified berry or fruit (37). All are of minor importance as foods.

Several plants that are ascribed to the native period probably reached the Pacific on European ships; these include chili pepper and sugar cane, which are mentioned in some legends, cassava, and mango. These plants may have been introduced from other islands before effective contact with the outside world was established, or they may have come afterward. Peppers became the most important in that they serve even as a substitute for meat and seafood, whereas cassava became a lesser substitute for yams and breadfruit. Sugar cane and mangoes are of minor importance in the Ponapean economy, although sugar cane and, temporarily, cassava were later developed commercially by the Japanese.

The Pre-Spanish period, beginning about 1826 after effective contact with the outside world had been established, saw the introduction of soursop, a sweet cane, and tobacco. The introduction of citrus was not ascribed to a period, but it was presumably introduced after 1825. Each period after contact saw the introduction of new varieties of plants that were already known, and during the Pre-Spanish period many new varieties of yams were introduced through the American whalers and missionaries.

In the Spanish period sweet potatoes and pumpkins were introduced, both of which have been accepted as substitutes of lesser importance for yams and breadfruit. A number of fruits were introduced, including pineapple, papaya, guava, watermelon, cacao and corn (both of which are treated as fruit), and Caesalpinia, whose seeds are eaten though it is planted for its flowers. Coffee, which became important as a morning drink, was first planted during this period, though it has continued to be imported.

In the German period coconuts were established as the basic crop in the commercial economy. This period also saw the introduction of cucumbers, beans, and onions, unless onions had been introduced earlier.

In the Japanese period "Hawaiian taro," which ranks fifth as a substitute for yams and breadfruit, and eggplant were introduced as well as a number of plants that were used only by Japanese. The appearance of the leafhopper made taro difficult to grow and decreased its importance. The root borer appeared, destroying the economic importance of all older varieties of bananas, but three new borer-resistant varieties were introduced. The introduction of the snail greatly increased the difficulty of raising many important crops. Coconut production by Ponapeans continued to expand. Large Japanese plantations of coconuts and sugar cane were established, without markedly effecting the native economy, and the commercial production of pineapple was contemplated as a postwar venture.

Some of these new plants offer possibilities for future development but, if this summary has any historical validity, contact with the outside world has had remarkably little effect on Ponapean agriculture, aside from the new plant pests with which farmers now have to contend, a fact from which all can learn a lesson.

The only major change has been the development of coconuts, an old crop, as the basis of the commercial economy. Many new foods have become available but are of minor importance. The only significant changes in patterns of consumption resulting from the introduction of these new plants have occurred in connection with chili pepper, coffee, and tobacco, none of which has any real importance in subsistence. Far greater changes in consumption took place in the remote past, during the adaptation to the fertile soil and heavy rainfall of a high volcanic island, when many crops basic to atoll life lost their importance and were replaced by breadfruit, yams, and other foods.

10. FISHING AND HUNTING

FISHING

Fish provide the major source of protein in the Ponapean diet; but fishing did not enter into the prestige economy. Commercial bonito fishing was developed late on Ponape, but it grew very rapidly and in a few years surpassed copra in the value of exports. In comparing the exports of copra and bonito (karangăp) in table 14 it should be remembered that, although copra was produced on other islands in the Bureau, bonito fishing was confined to Ponape. Bonito fishing was established by Okinawans about 1934. By 1937 the bonito catch (undried) was 4,064 metric tons valued at 406,396 yen as compared with 112 kilo valued at 45 yen caught in 1924. The quantity and value of dried bonito produced and exported from the Bureau is shown for the years available in table 16 below.

TABLE 16

Production and Exports of Dried Bonito from Ponape Branch Bureau

Year	Production		Exports	
	Quantity (pounds)	Value (yen)	Quantity (pounds)	Value (yen)
1936	948,842	388,163	581,787	389,008
1937	1,453,373	540,927	-----	452,831
1938	572,317	280,343	-----	-----
1939	1,386,700	504,301	-----	-----
1940	-----	-----	664,853	1,001,163

Just before the war about five small Okinawan companies and the large Japanese firm of Kohatsu were engaged in bonito fishing. The Okinawans operated with little equipment other than their boats, and relied mainly on their wives and children to clean and dry the fish. As each boat came into the harbor it signaled the size of its catch to shore, using one blast for each 100 fish and a special blast to indicate 1000 fish; the size of the catch could also be read from the flags that the boats flew. By the time the boat docked the relatives had assembled and enough casual laborers had been recruited to take care of the catch. Work started immediately and continued as far into the night as was necessary. The heads were cut off and the fish were opened and cleaned with a speed and machinelike precision that was commented on by all observers. By their efficient organization of a flexible labor supply, the Okinawans were able to do without refrigeration. Their drying sheds and wharfs were located just across the river from the Colony, on the western side of Nęt Point, from which a jetty, intended to supply fresh water to ships at anchor, juts out into the harbor.

Kohatsu entered into bonito fishing, after it had been established by the Okinawans, through a subsidiary known as Nankosuesan. They had a large pier near the middle of the business district of the Colony, a modern refrigerating plant, and chilled rooms in which the fish were stored immediately upon being brought in, after which they could be cleaned and dried at lesure. It is said that Nankosuesan planned to use large refrigerated boats after the war that could operate outside the reef for three or four days at a time.

The fishing boats were small diesel-powered boats somewhat larger than the "pompoms" used for travel about Ponape. About nine of these are said to have operated in the waters around Ponape, all out of the Colony. Occasionally they went around the island or as far as to Ngatik and back, but for the most part they did not go more than a few miles outside the reef, usually on the leeward (SW) side of the island. In January and February the boats laid up for repairs when the heavy seas of the trade-wind season made fishing dangerous. The fishing crews are said to have also joined the natives in visiting Ant atoll between May and July, when the bonito enter the lagoon to spawn, and are said to have caught bonito during this season with nets. At this time natives, standing in shallow water, catch bonito by hand. The original inhabitants of Ant formerly monopolized this form of bonito fishing, and during the spawning season they caught and smoked enough fish to last throughout the year both for their own use and for barter with the people of Ponape. Since the people of Ant have been replaced by the employees of the Nănipĕi Company, the monopoly has ceased, and Ponapeans sometimes visit Ant during this season.

Normally the Japanese boats operated in the open sea. Aside from the captain and the engineer, who helped in the fishing, each boat carried from twenty to thirty fishermen. The men watched for flocks of terns diving into schools of săip or sătĭn (sardine or herring), knowing that bonito were likely to be nearby. When bonito were located, live săip or sătĭn that had been caught the same morning were dumped overboard and the fishermen lined up on both sides of the boat with short bamboo poles with six-foot lines and two- or three-inch iron hooks baited with săip. In the midst of a school, fish could be caught as quickly as they could be pulled in, and it is said that as many as one thousand could be caught in half an hour in this way. Most of the time was spent in locating and following the bonito. Sometimes boats returned with only sixty fish, but on the whole bonito fishing is said to have been good, and often the fishermen came home with two thousand fish, having stopped fishing because the boats could hold no more. Japanese reports list 336 Japanese men and 70 Japanese women as engaged in fishing in 1937. They show 48 native men in the same occupation in 1936, but none in 1937 or 1940.

Bonito fishing continued until the surrender of Ponape in September 1945, though after 1943 it was directed toward meeting the needs of the local Japanese population. After the Colony had been burned to the ground, in February 1944, Ponape served as a target for practice raids by American planes; these raids followed set schedules for periods ranging from several days to several weeks. The bonito fleet adjusted its activities to the schedules of the American planes and went out to sea as soon as they had left.

There was only a period of a month or two when deep-sea fishing had to be completely abandoned because American planes were in the air all day long.

The Japanese bonito industry was of only indirect benefit to the people of Ponape, but it demonstrated the value of resources that can be exploited for their benefit. A few Ponapeans were employed on a casual basis as fishermen on the bonito boats and had the opportunity to learn the techniques of bonito fishing; there are perhaps seven who know enough to act as "captain," in addition to the large numbers of out-islanders who by tradition are familiar with fishing outside the reef. There are also said to be about twenty Ponapeans who know how to operate the Japanese fishing boats and could serve as "engineers" (mechanics). One Ponapean crew was preparing to begin bonito fishing for the local market, with hopes of export trade in the future.

Mechanical training for "engineers" should be a part of the normal American educational program. It should not be difficult to teach Ponapeans how to clean and dry bonito and the techniques of catching them are easy, if uncertain. Arrangements to finance the purchase of fishing boats could be carried out if the industry had a reasonable chance of success. Lack of motivation is possibly the main obstacle to the establishment of a native export trade in bonito, and this involves a question that cannot be answered until it is put to the test. How many Ponapean and out-islander families are willing to work steadily enough at bonito, day after day, from the catching of the live bait early in the morning until the catch has been tediously and mechanically cleaned and placed in the drying shed at night, to make bonito exports commercially profitable? If there are three hundred such families on Ponape, or willing to live on Ponape, the income of the Ponape Branch Bureau may be doubled. If there are fewer, the export of bonito may still be commercially successful. The major obstacle can be reduced by providing refrigeration so that bonito may be cleaned during the following day.

The possibilities of a native industry in the export of dried bonito warrant a trial, which should be made after prices and the right to use Military Government refrigerator space have been established, and preferably with a specialist present to advise on the curing and the catching of bonito. The trial should be made with several of the most likely native teams, but need only be on a small scale. If the abandoned Japanese boats are no longer in working order, the new boats required could be assigned, and these could be transferred to other parts of Micronesia, should the trial prove unsuccessful. If successful, it seems likely that the best system of organization would be a number of small companies or fishing teams. There might be one or more Ponapean company, and one or more each for residents from Kapingamarangi, Ngatik, Mokil, and Pingelap. Each team might own its own boat and drying shed, or two or more teams might alternate with the same equipment, in addition to sharing refrigerating equipment with the other companies.

After 1916 the Japanese required licenses costing 2 yen for commercial fishing. Licenses that cost 10 yen with a renewal fee of 5 yen were required for the breeding and culture of fish and shellfish, fishing with stationary appliances, fishing for pearl oysters and nilotic-top and Hirose shellfish, the catching of hawksbill turtles, sponge fishing, coral fishing, whaling, pelagic fishing from a base in the mandated area, fishing with poles or ropes, using a screw-driven power boat of more than 5 tons, and transporting or disposing of marine products caught. Closed seasons and minimum sizes were established in 1936 for pearl oysters, nilotic-top and Hirose shellfish, and hawksbill turtles. Traditional native fishing techniques were not restricted until 1936 when licenses issued without fee were required by ordinance. These licenses were not mentioned by informants and it is possible that this provision was not enforced on Ponape.

Ponape subsistence fishing is done mainly with nets and is for the most part restricted to the reefs within the lagoon. A number of reef formations are distinguished, of which the most important are the inner reef (mathalap), which fringes the shore of the main island and which in many places is covered with mangroves; the coral heads (mathapẹi), which rise in the middle of the lagoon and are isolated from both the main island and the outer reef; and the outer barrier reef (pāina), which with its small coral islands (thẹkẹ) and sand banks encloses the lagoon. There is relatively little fishing in the deep waters (lām or nām) of the lagoon, or in the fresh water (pïlimaur) of the rivers and mountain streams. There is none in the open sea (māthau) except by the out-islanders and, formerly, the Japanese.

Fishing (lāith) is closely related to the tides. The depth of the water on the reefs affects both the techniques employed and the type of fish caught. As the tide comes in, the smaller fish are replaced by the larger ones that come up out of the deep water of the lagoon to feed on the vegetation of the reef or to prey upon smaller fish; the succession of types of fish is reversed as the tide recedes.

When the water on the reef is only six inches deep, the three kinds of fishes most commonly caught are mwängarẹpwẹt (Holocentrus sp.),[6] lẹtẹpwẹl (Hepatus triostegus), and llarpwatar (Chaetodon sp., or the butterfly fishes of many colors). Tānsẹu (Flammeo scythrops), lithoi, kāiwẹlẹ, palapal, sāmwe, and sāmanip and other "hiding fishes" are commonly caught. When there is this little water on the inner parts of the reef, the outer edges of the reef where the coral growth is greatest are exposed, and many of the small passages through the outer coral to the deep waters of the lagoon are too shallow to permit the fish to escape. The "hiding fish" (mwẹmwẹn kẹtik) can be caught by men with spears, by women with small hand nets, or with bare hands.

Hand fishing (pwathipwath) is properly women's work, but it is also done by men who are out on the reef fishing when the tide goes out. A stone is thrown into the water to frighten palapal and then a woman goes to the place where she has seen the fish hide and lowers her hands, palms outstretched, slowly into the water, pressing the fish into the sand until she can work her fingers around so as to pinch its eyes. Care must be taken not to frighten the fish or to let it slip away, and so that the hands are not cut with the sharp spines from which the palapal takes its name ("cut-cut"). The sāmwe, which lives mainly among the mangroves, but can be caught on the reefs, swims only about thirty feet when it is frightened, and then buries itself in the sand or hides in the coral where it can be caught by hand or speared. Hiding fish can frequently be caught

[6]Identifications are by Smith; for further details for commercial and subsistence fishing see his report (U.S.C.C. Vol. 9).

in holes in the coral near the passages to deep water, but there is always the danger in hand fishing of reaching into a hole and finding a poison fish, a sea urchin, or an eel.

The small hand nets (nāikẹtik) are used by women in two ways to catch the same kinds of fish. (For descriptions of the nets and other fishing implements see chapter 3.) When a woman fishes by herself (ukŏuk) she stands the two nets in front of her in the water with the handles braced against her knees. The nets are placed on either side of the stone under which the fish is hiding, and with the two points together. The stone is lifted up so that the fish swim into the nets where they are caught. When a group of from ten to thirty women, usually from the same section, fish together (kọukẹu), two women drive (ïthak) the fish into the line of nets held by the others. The driver on the right (ămwọ) and the driver on the left (ămwir) are given some of the catch as gifts (kisākis) by the women holding the nets, to each of whom the fish she catches belongs.

When the water is one foot deep palapal is the most commonly caught, with the golden yellow kāiwẹlẹmār second. Small mwọmāi, ŭmulą (Kyphosus fuscus), the small parrot fish māu (Pseudoscarus jordani), pąthipąth ŏrụng (Caranx ignobilis or Jack Crevally), pulak, ïomọ or mwathąl kātik, tọmọrok (Ctenochaetus strigosus), pulānking or pulak tọl (Callicanthus lituratus), and ïïoli, as well as lẹtẹpwẹl and sāmwe, mentioned above, are commonly caught.

At this depth most of the fishing is with small seines and large hand nets. Fish can still be speared or caught by hand, but the small hand nets are less satisfactory and are generally used when the water on the reef is less than a foot deep. The medium sized seine can be used, but it is better adapted to deeper water. The large hand net and the small seine serve much the same purpose and are used to catch the same kinds of fish; both may be used in some spots when the tide is as low as six inches or as high as four feet, but they are most effective between one and three feet.

Seine fishing (ŭk or waranuk) is done by men with canoes, and for a small seine (ŭkẹtik) or medium seine (sąkisąk) only one canoe is necessary. The sŏuseth ("expert fisherman") who is in charge, watches for fish as the canoe is poled or paddled along the edge of the reef. If he sees the tails of māu sticking out of the water where a group is feeding, or the ripples in the water caused by fish swimming, or if he can detect the less obvious signs of other kinds of fish, he directs the paddlers to one of the passages through the outer coral of the reef.

Two men take the net and climb out on the reef as quietly as possible. They separate, spreading the seine in front of the passage, and then walk onto the reef, trying to get behind the fish so as to drive them through the passage into the net. They throw pieces of coral picked up from the reef behind the feeding place to frighten the fish into the net, or to head off those that try to escape through other passages into the deep water. The third man beaches the canoe and guards one end of the net, throwing coral at fish that try to swim past the other end.

The two drivers, who often carry their throwing spears when they go on the reef, hunt through the area for any hiding fish that can be found and then come back to the net to help collect the fish that have been caught. Almost all varieties of fish in the lagoon of Ponape, except pŏko (shark) and ŏrụng (Caranx ignobilis) "die" after a few attempts to escape through the net to deep water; they lie quietly in the water and can be picked up by hand without putting up a struggle. Fishermen may catch ŏrụng trapped in the net by hand by swimming under water after them; but since this is very difficult, the two ends of the net are usually brought together and the fish are then picked out. When shark or nĕu (scorpion fish) are caught in the net, they are killed with spears.

The seine is dropped just off the edge of the outer coral where the reef begins to fall away into deep water, and it must touch bottom. The small seine, which is from about 6 to 9 feet wide, can be dropped in water between a foot and a half and 3 feet deep. The medium seine is 12 feet wide and is dropped in from 3 to 6 feet of water. The gill net or large seine (ŭkalap) is 24 feet wide and is dropped in depths of from 12 to 18 feet on the edge of and just off the reef where the water is a brilliant emerald green.

The sŏuseth must know the fishing grounds, the habits of the various kinds of fish, and the passages in the reef through which the fish will try to escape. Usually the net is not dropped unless he sees definite evidence of a group of fish feeding, but he may decide to take a chance and drop the net by a passage leading to a feeding ground which he knows is popular, even if he can see no signs of fish.

The large hand net (nāikalap) is used in the same manner (kẹukẹu) as the small hand nets, but usually by men rather than women. A number of men line up their nets on the edge of the reef and two of their group drive the fish towards the net. Fishing (thakathok) with the very large hand net (nāik ẹn thakathok) is done only by men, using a method like that of seine fishing. The reef is approached by canoe and the nets are put into the water just outside a passage through the outer coral. A man may do this alone, or from ten to thirty men from a section, each with his own net and canoe, may line up along the edge of the reef while two drivers (ămwọ and ămwir) chase (ïthak) the fish toward them.

When the water on the reef is two feet deep, the small and medium-sized seines and the large hand nets are still most commonly used, though the large seine can be employed in some places. Mwọmāi is caught in greatest numbers in lengths up to 12 inches. Pakas, ŏrụng, pulak, and mwọmwpalipal, all in lengths up to 12 inches, are also commonly caught. Most of the fish caught when the water is shallower have disappeared at this depth.

When the water on top of the reef is between three and four feet deep, medium and large seines are generally employed, whereas the small seine and large hand net become less effective at depths of more than three feet. The three fish caught in greatest number are ŏrụng, pulak, and pakas; mwọmāi and pămą are also caught. With the exception of pămą, these are all older and larger fish of the same varieties commonly caught when the water is shallower; they are described as between 18 and 24 inches in length and from 3 to 5 pounds in weight.

When the water is 5 or 6 feet deep, which is as deep as it usually becomes, only the large seine can be used. The large green wrass, kamāik (Cheilinus undulatus), which is as much as 4 feet in length and 90 pounds in weight, is caught most commonly. Large pulak and pakas, mentioned above, are also caught, as well as tĕp and mărąr that are about the same as

kamäik in size and weight, and turtles, wĕi, which come onto the reef to feed at high tide.

Fishing (ūk, waranuk) with the gill net or large seine (ūkalap) requires two canoes, the first to carry and drop the seine and the second to hold one end. Both canoes pull into the reef at one side of a passage through the outer coral. A man from the second canoe slips into the water, pulls one end of the seine in to the reef, and holds it there with the help of his canoe. The first canoe pulls away from the reef and crosses to the other side of the passage, the seine being fed out in an arc in front of the passage. When the seine has been dropped, the sǭuseṯh and the net man at the other end swim down under water to see that it is touching bottom and that its ends come into the reef. The sǭuseṯh and the second canoe stay by the ends of the seine to see that the fish do not escape around it, while the first canoe is poled onto the reef to drive the fish into the net. The poling men in both canoes have a supply of coral fragments, which they have collected beforehand, to throw at the fish, and once the fish start to run, the polers in the first canoe pound the water with their long poles while the men by the net splash with their arms. When the fish have stopped struggling, fishermen collect them by swimming under water. Many Ponapeans cannot use the large seine because they cannot "dive" deep enough to gather the fish caught in the net.

The large and medium seines can be used every day of the month. The large seine or gill net is generally used at depths of three feet and more, but it may be used in some spots when the water on top of the reef is only two feet deep. The sǭuseṯh knows these spots along the reef and fishes them during the period when there are no marked high or low tides. They are known by the same name (uṯakos) that is used for the period when there is "no tide." During these periods, fishing is best in the morning, beginning from about 8:00 to 9:00 A.M., and the fishermen stay out until they have caught all the fish they need. Fishing with the gill net or large seine is best when there are marked high tides. In these periods fishing lasts about five hours, from the time when the incoming tide has reached a depth of three feet on top of the reefs until it has receded again to the same depth. The small seine, the large hand nets, and the small hand nets can be used only when low tides occur, or about two weeks out of every month. Nevertheless the small seine is the most popular fishing implement on Ponape. Small seines are widely used by men and the small hand nets by women. Because of the war there were fewer of these than there would normally have been, but even before the war only a few fishermen had large seines, and medium seines and large hand nets were not numerous.

Fishing is also done along the outer edge of the outer reef, where there are large mixed schools (mwālus) of mwǫmwpalipal, tǫmǫrok, lita, māu, mwǫmāi, pāmạ, katik, pulānking or pulak tǫl, kạrikạr, wakapw (Holocentrus sp.), thārụp, thingimạ, paraparāilik, palapal, pạthipạth and kāiwẹlẹmār. All these are caught together with the small seine at low tide, sometimes as many as one hundred fish being caught at a single dropping of the net. The sǭuseṯh manages the canoe, keeping it just outside the breakers while two men get out with the net and take it in to shallow water. The sǭuseṯh then brings the canoe in to shore through the breakers and drives the fish into the net. This kind of fishing is very profitable, but dangerous. Canoes are often badly damaged and the men with the net swallow large amounts of salt water and are battered against the coral in struggling through the breakers, and sometimes they are attacked by the sharks that feed on these schools of fish.

Neither the large seine nor the large hand nets are used on the outer edge of the outer reef. The small seines can be used there only at very low tide. Small hand nets are sometimes used in this area, but not in water deep enough to catch fish of the mixed schools; the same kinds of hiding fish are caught with them as on the reefs within the lagoon.

Large hand nets and small and medium seines are used at night on the reefs within the lagoon when the water is between two and four feet deep. At this time some of the fish found on the reef in daytime are caught, as well as a number of flesh-eating fish that come up on the reef only at night to feed on smaller fish. The two fish most commonly caught at night are māsokoth and pwālal. In addition ǭrụng, kīr or āiwil, kǭil (which is not flesh eating), kǭng, ikīẹpw, kạrikạr, samwīnpōrar (which does not come up onto the reef but is caught along the edges), kēipwaipw, tikilẹ, sawīpwīliẹt, āsẹmẹl, mūn (Myripristis murdjan), and sāra (Holocentrus leo) are also caught.

At night the large seine is used only to catch turtle (wĕi) at high tide, but likạnthinikạp (stingray) may also get caught in the net. These can be speared for their barbs or they may be let out of the net. When a turtle is caught in the large seine, day or night, the fisherman dives after it, grabs it by the shell at the head and tail, and twists it so that its head points upwards so that the struggles of the turtle to get away help to bring it to the surface. Torches are not used in seine fishing even on dark moonless nights when fishing on the reef is best. The fishermen can tell whether a turtle or stingray is in the net by the pattern of the phosphorescence in the water, as well as by the location of the smaller fish caught in the net. The small hand net is sometimes used at night on the reefs at low tide to catch the same fish that are caught with it in the daytime.

On moonless nights fishing may be done with coconut leaf torches (inthil) and knives or throwing spears when the water on the reef is no more than a foot and a half deep. At night both "day fish" and "night fish" lie quietly in shallow water "sleeping" among the coral, and can be speared or killed by a quick blow with the knife. When the tide comes in and the water is deeper, the fish swim about feeding, and can be caught only with nets. Fishermen frequently go out at night to fish, first with torches and knives and later with seines or large hand nets. When the moon is bright, fish may be caught in the same way without torches, but there are fewer fish on the reef when the moon is out. The commonest fish caught by torch and knife are the sāmwe, īomǫ or mwathāl, and kīǫk, in that order, and mwāngạrẹpwẹt and lẹtẹpwẹl, most of which are hiding fish. The out-islanders from Mokil and Pingelap sometimes hunt flying fish such as mạngạr or mwǫmwpīr (Belonidae) at night with torches, catching them when they jump out of the water toward the light, hit the sail, and fall into the canoe. This method is not used by Ponapeans, who say that the fish that they catch in torch fishing are not attracted by light.

Throwing nets (ūk lạkitạk) are used along the edges of the reef at low tide, mainly to catch flying fish, jumping fish, and māu, though hiding fish are often caught incidentally. Both jumping fish (mwǫmwlūs),

which leap out of the water or skitter along the surface, and flying fish (mwọmwpïr) can escape over the tops of the seines, though they are sometimes caught with large hand nets. The mău (Pseudoscarus jordani) is very easily frightened and is difficult to catch with seines and hand nets. Ponapeans say that mău and other fish that feed in schools on moss and vegetables on the reef post "watchmen" to warn them of approaching danger. With the throwing nets, the fish usually caught are mullet (liṁwẹr or ă, Mugil spp.), kïọk, sămwe, ïkẹm, lẹtẹpwẹl, kăiwẹl, mău, and mọ̈ngtạkăi. Throwing nets are ineffective in deep water, and therefore can be used only during a part of the month. They were introduced in the Spanish period and are not common.

The fine-meshed hand net (lŭkŏuk) may be used at low tide to catch small fish from one to six inches in length, particularly toik which was highly prized in early days because of its marked oiliness. The nets are propped up on the edge of the reef, and pieces of coral are placed in front of them to provide hiding places for the toik and other small fish. Then a group of women starts working across the reef from the opposite side, picking up pieces of coral and catching any small fish hiding underneath by hand. Those they miss are driven toward the net where they hide in the coral provided for them until they are caught. This kin d of fishing is known as wẽirar.

The dip net (kipẹn) is used to catch toik and nŭth (squid) in the lagoon and likathạpw (shrimp) in the fresh water of the mountain streams. Neither the dip net nor the fine-meshed hand net are common today.

Fish poison (ŭp) can be used near the upper edges of the reef and on top of the reef when the water is two feet or less deep. Bundles of derris root are pounded with a piece of corla and then pushed into holes in the coral in which fish are hiding. The stupefied fish can be picked up by hand or speared, if this is more convenient. Mwängarẹpwẹt (Holocentrus sp.) is most commonly caught with fish poison, after which come lïarpwatạr (Chaetodon sp.), lẹtẹpwẹl (Hepatus triostegus), tọmọrok (Ctenochaetus strigosus), mărạr, pŭpw (Balistapus sp.), lithoi, pwạrạs, pulänking or pulak tọl (Callicanthus lituratus), pạthipạth, kăiwẹlẹmăr, and palapal. Fish poison is widely used on Ponape, particularly by women. There is no evidence that the Japanese regulation of 1936 prohibiting the use of poison (also of dynamite and electricity) was enforced on Ponape with reference to native fishing methods.

Fishermen use the throwing spear (kạtiẹu ẹn thok) both when wading on the reefs at low tide and when poling across the reef in a canoe when the water is two feet or deeper. Fish most commonly killed at less than two feet are sămwe, kïọk, lẹtẹpwẹl, ïomọ or mwathạl, and white eels, läpwẹth pwetẹpwẹt (Conger cinereus); at two feet kïọk and liṁwẹr or ă (Mugil sp.); and at higher tides, kẽipwaipw, sawïpwïliẹt, and tikilẹ, which are from three to five feet long.

Short diving spears (kạtiẹu ẹn thu) and glasses (klăs) are sometimes used under water along the outer edge of the reef, near the places where the large seines are dropped. Tọmọrok and kïọk are most commonly caught, after which come kạrikạr, pulänking or pulak tọl, ọ̈rụng, and mău. Mău are easily frightened when feeding on the reef but can be approached without difficulty in deeper water. The long heavy diving spears are used in still deeper water to kill turtles or kamăik. Diving spears were said to have been introduced by Okinawans in the Japanese period, and were not commonly used by Ponapeans. The out-islanders and one or two Ponapeans were good divers, and one Ponapean was amazingly accurate with the throwing spear. The type of underwater spear (kạsik) that is shot by a rubber band and is locally referred to as a "bow and arrow" or "gun" (Kạsik) was introduced to Ponape only in the postwar American period, when it was brought back from Kusaie by Ponapean laborers who were repatriated in October 1945. It was not yet being commonly used, though several fishermen were experimenting with it.

Fishhooks were unknown on Ponape until they were acquired through trade with the whalers in the pre-Spanish period. No stone or shell hooks of the type widely used in Micronesia for trolling were used on Ponape in the native period, nor are feathers or fibers used as lures today by Ponapeans. Trolling (luk) for fish has been practiced on Ponape by the out-islanders from Mokil and Pingelap since early in the Japanese period but has not been adopted by the Ponapeans, some of whom now use imported iron hooks dropped from canoes in deep water. The commonest bait for the larger flesh-eating fish are săip or sätïn (sardine or herring) and ṁpwa, a small brightly colored sand crab. Breadfruit, rice, or other vegetables are sometimes used as bait for kïọk and kăiwẹlẹ.

Only flesh-eating fish can be caught with the hook and line regardless of the bait that is used. Many of the favorite Ponapean fish cannot be caught except by use of nets, spears, or poison. Among these are kamăik, mwọmăi, pulak, lẹtẹpwẹl, tọmọrok, mău, liṁwẹr or ă, mọ̈k, pämạ, pulänking or pulak tọl, kọ̈ng, kitạl, all of which are eaten raw, and mărạr, ïomọ or mwathạl, and paraparăilik, which are too greasy to eat raw even though they are said not to feed on flesh or to rise to the hook. Ponapeans hold that the best fish for eating raw are those that are not flesh eating, since these are less greasy. A number of large fish that might otherwise be eaten, are seldom caught because trolling with hook and line is not widely used. These include karangăp (ahi, skipjack, or ocean bonito), sürẹ (wahoo), waliwal (said to be a large kind of bonito), sawïpwïliẹt, ọ̈rụngạtọl, and walaksọu.

Fish traps (ŭ) and fish weirs (măẹ) are no longer used, though both were formerly common. Fish traps became obsolete in the Spanish period and fish weirs in the German period. Both are used on Ponape by the out-islanders from Yap, and fish weirs were used by the Japanese until the bombing of the Colony in 1944. With the Ponapean fish trap, any small fish, three inches wide or less, that could pass through the entrance was caught, regardless of whether they normally came on the reef during the day or night or at high or low tide. With weirs, which were built on the inner reefs at the mouths of rivers, sămwe were most commonly caught, after which came kïọk and ïomọ or mwathạl. The fish were actually caught with small hand nets as they tried to pass through the mouths of the weir as the tide was receding. From ten to twenty people went out to the weir together, depending on its size and number of openings. Weirs were only three feet tall and were covered with water at high tide allowing the fish to escape over the top. They were used only at low tide at night.

The price of ordinary fish is said to have been 7 sen a kilo before 1937, and 20 sen a kilo from 1937 to 1944, when the bombing of the Colony was followed by an inflation. Ọ̈rụng brought 10 sen a kilo before 1937 and increased to 40 sen a kilo and higher. Liṁwẹr

or ā brought 10 sen a kilo before 1937 and probably increased thereafter. Both of these fish and sāip or sātīn were dried for export by the Japanese, though they do not show in the export figures. Kamāik sold for 60 sen about 1937, and later, before the bombing, the price dropped to 47 sen a kilo; but after the bombing a single fish sold for as much as 10 yen. The price paid by the Japanese for bonito before the war was not learned, but bonito two feet long were sold after the bombing for at least as much as 25 yen. Japanese reports give the price of dried bonito on Ponape in 1937 as 1.20 yen per kilo. Under Military Government there was only one price for all fish in 1946, 5 cents per kilo wholesale and 7 cents per kilo (less than 3-1/2 cents a pound) retail.

Japanese sources give the following figures for fish other than bonito caught in the Ponape Branch Bureau: tunny, 795 kilo valued at 495 yen in 1924 and 56.4 metric tons valued at 11,277 yen in 1937; horse mackerel, 1,477 kilo valued at 566 yen in 1924 and 24.5 metric tons valued at 5,451 yen in 1937; grey mullet, 465 kilo valued at 176 yen in 1924 and 9.1 metric tons valued at 2,011 yen in 1937; other marine life valued at 2,272 yen in 1924 and 1.0 metric tons of Cybium niphonium valued at 219 yen and 23.5 metric tons of other fish valued at 4,289 yen in 1937. All these figures reflect the growth of the Japanese deep-sea fishing and probably had little effect on native income.

Of the many kinds of fish caught in various ways, the three most commonly eaten by Ponapeans are, in order: sāmwe, palapal, and kāiwęlęmār. The six best liked are, in order; kamāik (Cheilinus undulatus), tęp, limwęr or ā (Mugil sp.), pulak, karikar, and mwomāi. Of the 123 kinds of fish recorded, only four were said not to be eaten: a tiny fish, pwętarar, no more than two inches long, which no one bothers about; a small fish, mwomwitik, which no one knows how to catch because it does not come up on the reef or bite at a hook; the swell fish, wāth (Tetrodon sp.), which is fatally poisonous; and the lion fish, talīręr (Pterois sp.), whose tiny poisonous spines are difficult to remove. Even the scorpion fish, nēu (Scorpaenopsis sp.) is eaten if it is caught in the net or if it can be speared easily, though no one fishes specifically for it. The people of Yap and the Mortlock Islanders on Ponpae are said to "know how to eat" the swell fish after skinning and gutting it. Fresh-water fish (pālọyọ and parapar) living in the streams and rivers are eaten only by a few people outside Nęt District because Ponapeans regard their taste as inferior to salt-water fish.

Rays (likanthinikap, pāpārok, pāwāwā) and the Snake eel (nālipuloiloi) are not eaten, while the large fresh-water eels (kamīsik) and sharks (pōko, tānpai and several unnamed varieties) are not often eaten. Several other varieties of salt-water eels, lāpwęth pwętępwęt (Conger cinereus), lāpwęth ēlam (moray), and mwasāut are eaten, as is squid, nūth (Sepia sp.).

All the forms of marine life discussed above, fishes, sharks, eels, rays, and squid, are classified together by Ponapeans as mwāmw or "fish." Most other forms of marine life, including shells, crabs, trepang, sea urchins, starfish, sea horses, octopuses, sea anemones, and other forms that cannot swim are grouped together as manīka or "mollusks." Crayfish or lobsters and shrimp, both of which are sometimes spoken of as manīka, and turtles are generally regarded as in classes by themselves. The same is true of sponges, which are used in bathing, and in washing dishes; these were sold to the Japanese, but have not been exported.

Two varieties of turtles (wēi) are eaten, one (sāpwākę), which is wild and which fights very hard, and the other (kalāp), which is easier to catch. Turtles may be caught at night with the large seine or they may be killed with the diving spear. The diving spear has replaced the earlier method of hunting turtles, in which a man used to swim down and climb on a turtle's back, grab its neck with his hands, passing his arms under the turtle's front legs, and be pulled up to the surface with a rope tied around his waist by his partner in his canoe. Some fishermen stick a pole into the reef through seaweed upon which turtles feed, and by putting out bait in this manner acquire temporary fishing rights for turtle in the immediate vicinity. The small atolls of Ant, Pakin, and Oroluk are favorite hunting grounds for turtles, which can be caught there by flipping them over on their backs after they have laid their eggs in the sand. The Japanese fishing ordinance of 1936 prohibited catching turtle on land in the mandated area.

Several natives on Ponape held Japanese licenses to catch turtle. Turtles described as three feet long and weighing as much as 150 kilo have been caught, and turtles too heavy to weigh on the fishermen's 100-kilo scales were not uncommon. The months of June, July, August, and November, December, and January were closed seasons for turtle fishing, and turtles less than 2 feet long could not be caught. The Japanese themselves also fished for turtle, and kept live turtles in pens built on the reef and sand beach of Ląngar Island in the Colony harbor. Turtles were not bred in captivity, but on Thọlętik, a small island in the outer reef near Section K19, an experiment in raising small turtles was terminated when the pens were destroyed by American planes.

Turtle flesh was highly prized by both Ponapeans and Japanese. Prior to 1937 the price of turtle meat was 30 sen a kilo when that of ordinary fish was 7 sen a kilo. The small factory that canned pineapple and other fruit is said to have canned small amounts of turtle meat. Under the Japanese, turtle shells sold for 8 yen a kilo for the good grade, which had distinct dark and light markings, and about 5 yen a kilo for the poor grade, which was reddish and with little marking. Turtle shells of the poor grade brought 20 yen each, regardless of size. A good-grade shell brought from 60 to 80 yen if it was two feet long and about 120 yen if it was three feet long. Intermediate grades were recognized and Japanese traders, if they particularly wanted a certain shell, paid more than the price set by the government. In 1946 Military Government recognized only two grades of turtle shells, based on thickness rather than marking, priced at 80 cents and one dollar a kilo. The price of turtle meat was set at 5 cents a kilo wholesale and 7 cents a kilo (less than 3.5 cents a pound) retail, which was no more than the price of fish. Both prices were considered too low by the fishermen. Trade in raw turtle shell and turtle-shell combs, buckles, and rings is old both on Ponape and on the other islands of the Bureau, but has never been large. The Bureau's exports of manufactured turtle shell are given as 6.8 pounds valued at 8,590 yen in 1936, and as nil in 1940. The catch of turtles for the Bureau is given as 67 kilo valued at 45 yen in 1924 and 0.1 metric tons valued at 1,116 yen in 1937.

Two varieties of lobsters or crayfish are caught,

by men with spears and goggles or with large hand nets. The large variety (ūranna) weighs up to about three pounds and was sold to the Japanese at 25 sen each. The Military Government prices of 20 cents retail and 15 cents wholesale per lobster, were too low to bring them in to the Navy mess with any regularity. Ten a day is a large catch for a man, unless he is lucky enough to find a group of them congregated under a coral boulder which they use as their "house" in daytime, when he may catch as many as twenty or thirty. The smaller variety, whose name could not be recalled by the informant, was not purchased by the Japanese, who caught their own.

The fresh-water shrimp (female, likathąpw or ~~lik~~-likathąpw ęn pïl; male, likosïang) is best liked. It is caught with dip nets in the mountain streams by women. The Military Government price of 20 cents per kilo (9 cents a pound) retail and 15 cents per kilo wholesale was again too low to bring them in regularly. A similar shrimp (likathąpw ęn sęth) and a tiny shrimp (lūr), described as the size of a grain of rice, are caught in the salt water. The latter swims into the lagoon and up the rivers by the millions each year about April, when men, women, and children stand in the shallow water along the river banks and scoop them up with baskets, bowls, or whatever is handy. Another very large shrimp (iñsąng), which is said to kill turtles by eating their eyes, was eaten by the Japanese but not by the Ponapeans.

The best-liked crab is ǭlïmǫ (Samoan crab) which may be caught in the daytime by men or women by hand, by men with the spear, or by women with a forked stick, which is used to pull it out of its hole in the mangrove swamp. On the night of the full moon these crabs can be picked up by hand in large numbers when they go down to the edge of the inshore reef at low tide "to look at the moon," and again, seven nights later, when they lie by their holes in the mud of the mangroves. Again the Military Government price of 15 cents retail and 10 cents wholesale per crab also failed to produce a reliable supply.

The next most commonly eaten crab is masāt, a small black crab that climbs the mangrove trees as the tide comes in and can be picked off easily by women. These and three other mangrove crabs (limpwęl, ñgkopw and kǫpųk) form an important part of the diet during the periods when there are no low tides. Two other varieties of mangrove crabs (sauthūthū or lisauthūthū and limatęlęnïak) are not eaten. In addition there are six varieties of crabs living on the outer reef and in the sand of its small islands (oñpw, mānipik, pwǫru, karās, rǫkųm, and ñgkoprai), which are eaten, and two others (lïsapwar and ñpwa), which were eaten by the Japanese but not by the Ponapeans.

One variety of "mollusk" (likith), that is described as a sea urchin with nonpoisonous spines, is eaten raw after the shell has been broken off. These are gathered on the inner reefs at low tide by women. A sea anemone (lït), which is found in large numbers on the inner reefs during the season of breadfruit harvest, is gathered by women who scoop them up with both hands into the canoe. They are cooked in a leaf-lined frame of stones into which hot stones are dropped, and they are eaten with limes and chili pepper. Three other kinds of sea anemone (sāntimwąi, rāraiāk, and limār), which disappear into the coral or sand when they are touched, are gathered by women, who place a hibiscus leaf over the hole where the anemone has disappeared and weight it down with a piece of coral. When the tide begins to come in, the leaf can be picked up with the anemone sticking to it; it is said that only the leaves of hibiscus will work in this way. These anemone are eaten after roasting, boiling, or baking. A small octopus (kïs) living in the outer reef is caught by men who "tickle" it so that it crawls up an arm or spear and then kill it by biting its eyes or sticking them with a knife. It is eaten raw, boiled, or roasted and is well liked. A similar creature with four arms covered with suckers (lipwïlūwǫ) is said to live in the mountain streams but is not caught or eaten.

Of the shellfish, the three most popular as food are lipwōi (Anadara antiquata scapha), pāsu (Tridacna gigas), and kōpil, an unidentified clam living in the mangrove beds. The Japanese bought lipwōi at 40 sen a kilo. They are very plentiful and once the four daughters of Nānipōn (see below) earned 1,600 yen in four months selling them to Japanese in Section K19 and in Palikir. Twelve other bivalve shells, seven with spiral shells, and cowries are also listed as eaten. Cowries, the many species of which are all known as pwïli, cannot be eaten until a poisonous part has been cut out. Both the black pearl oyster, pwāi or pwāiemāi (Pinctada margaratifera), and pwāiaka (Atrina sp.) are said to have been eaten formerly when their shells were used as knives and plates. Shell fish are gathered for food by both men and women, though mostly by the latter. Some are roasted over hot coals, some are boiled, and some are eaten raw; they are commonly flavored with lemon and salt.

Black pearl oyster shells were bought by the Japanese and exported in small quantities to Japan for the manufacture of buttons. The prices paid to natives are quoted as 7 sen a kilo for small ones from about four to eight inches), 50 sen each for medium sized ones (from about eight to ten inches), and 3 yen each for large shells (over ten inches), which are very rarely found. The months of August through December were closed seasons for fishing pearl oysters under the Japanese. A few Japanese and a few out-islanders dove for pearls, but the Japanese are said to have shown less interest in pearls than the German traders, who bought them as early as the Spanish period. Pearls are occasionally found in pwāi or pwāiçmāi, pwāiąką, and pāsu, and were sold to the Japanese for between 50 sen and 5 yen each. There was no evidence of any pearl culture on Ponape.

Trochus has never been exported from the Ponape Branch Bureau but it was introduced from Palau in 1937 and planted on Ponape, as well as on Ant, Pakin, Ngatik, Nukuoro, Kapingamarangi, Mokil, Pingelap, and Kusaie. On the other islands the planting was done by Okinawans, but on Ponape a Palau man, Gabriel, was made responsible. From the notes he made at the time, it is possible to reconstruct the following summary of the numbers, dates, and places where trochus shells have been planted on Ponape. (Spellings given in parentheses are those used on the map which serves as the frontispiece.)

1. About 2,000 trochus were planted in the north on August 17, 1937 in the Colony Harbor (Ponape Harbor) off Nęt (Not) and Sokǭs (Jokaj) districts, at the following points: (1a) near Takatik (Takatik) Island, (1b) near Ląngąr (Langar) Island, (1c) near Sāpwętik (Japutik) Island, (1d) near Pārçm (Param) Island, (1e) on the west side of the passage through the reef to Colony Harbor (Ponape Harbor), (1f) on the west side of Sokǭs (Jokaj) Passage.

2. About 1,000 were planted in the northwest and west on August 18, 1937 of Sokȩs (Jokaj) District: (2a) on the southern end of Palikir (Palikir) Passage, and (2b) on the northern end of Tawăk (Tauak) Passage.

3. About 2,000 were planted in the southwest on August 18, 1937 off Kiti (Kiti) District: (3a) on the northern and southern sides of Pălęng Passage (Tauenpalang), (3b) near Kȩpara (Kepara) Island, and (3c) on the western and eastern sides of the passage to Rŏnkiti (Ronkiti) Harbor.

4. About 4,000 were planted in the south on August 19, 1937 off Kiti (Kiti) District: (4a) all near Rŏs (Roj) Island.

5. About 2,500 were planted in the west on August 19 and 20, 1937, off Matălanim (Matalanim) District: (5a) on the northern and southern sides of Lŏth Passage (Lot Harbor) (5b) on the northern and southern sides of Tamwęn Passage (Matalanim Harbor), (5c) at both ends of the artificial channel across the fringing reef near Muthokolos (Mutokoloj) Island, and (5d) on both sides of Arŭ (Aru) Passage.

6. About 500 trochus were planted in the northeast on August 20, 1937 off Ŭ (U) District: (6a) near Mänth Păithi (Mantapeiti) Island, (6b) near Mänth Pĕithak (Mantapeitak) Island, and (6c) on the eastern and western sides of Mänth (Mant) Passage.

Of the 12,000 shells, half were planted on the reefs off Kiti District. Because of the war, trochus was never exported for the manufacture of buttons, though shells near former Japanese settlements are evidence of the extent to which they were used locally for food. Since trochus (Trochus niloticus) was a new shell on Ponape, there was no Ponapean name for it. It is known today by one of two words: sŭmum which is the Palau name, or less commonly, tĭanĭna which is a Ponape word for a smaller Ponape shell with a similar color and similar shape. The people of Ponape have "learned how to eat" trochus from the Japanese, and it is now used for food by a number of people when it is found on the reef. There is no evidence that the Japanese prohibited trochus fishing at any season, but it is assumed they would have done so once the export trade had been established; in the absence of information pertaining to Ponape, the open season of May and June, which the Japanese allowed in other parts of the Carolines, was adopted by the U. S. C. C. for the 1946 season. Since the announcement that trochus would be bought at 5 cents did not come until early in June, the 1946 purchases did not cover the full season and there was not time to prepare for an organized diving program. If the price is maintained, production should be larger in the future. No trochus at all was purchased from the other islands in the Ponape Branch Bureau in 1946. The Japanese prohibited taking nilotic top shells less than 8 centimeters in diameter.

Trepang or bêche-de-mer has been an export product from Ponape and the other islands of the Bureau since the Spanish period or earlier. Christian who visited Ponape in 1896 speaks of it as "one of the staple exports." Japanese figures show a catch of 2,359 trepang in the Bureau in 1924 weighing 5,651 kilo and worth 889 yen before drying, and the production of 2,096 kilo of dried trepang valued at 1,160 yen. In 1937 the catch is given at 8.9 metric tons worth 444 yen, and 1.4 metric tons of dried trepang valued at 897 yen were produced. In 1936 7,043 pounds of dried trepang valued at 3,472 yen were exported; and in 1940, 469,640 pounds, valued at 56,123 yen. The reason for the low figures in the earlier period is unknown. Local estimates of exports for the years 1938-1940 indicate 50 tons a year from the Bureau, from two to five tons on each ship loaded at Ponape. On Ponape, trepang was caught and dried for export mainly by Japanese. Only one native, Nănipŏn (Chief B9 of Kiti) held a Japanese license to catch trepang commercially. His license was for two or three miles of reef on the eastern side of the island.

Măin according to this informant, was the best variety. It was bought by the Japanese at 47 sen per kilo, dried, but it was rare and 10 or 20 might be a man's total catch for a week. Torono was the second best; the price was also 47 sen, and 20 might be a week's catch. Limwasamwaswĕipwul was the third best. It was more common, about ten a day being an average catch, and the price was 40 sen a kilo. The informant heard that this variety brought several yen a kilo in Japan and China, and Christian describes it as "the most highly esteemed of all" for trade. Mătępw is said to be fourth best, and to have brought 47 sen a kilo. It is very small after it has been dried but it is plentiful, and a man might gather as many as 300 on a good night. All these varieties except mătępw are listed by Christian as "Class No. 1," in which he includes also pănipăn and likăpĭsĭno, which he believed to be the same, and a variety he calls limach that could not be identified.

Pănipăn was very important in the Ponape trade, and it is said that the Japanese were more anxious to buy it than to buy any other variety, although the price was only 40 sen and although it is rated below the first four types, listed above. From two to three hundred can be gathered in a night, and when dried they weigh about a third of a kilo each. Nănipŏn says that he and his crew averaged 100 yen a month, or one tenth of their total income from trepang, turtles, and fish, from this variety alone. Likăpĭsĭno is said to be the rarest of all commercial trepang on Ponape. It sold for 47 sen a kilo and two might be a man's total catch for a month. Kătupw is the commonest and one of the smallest varieties on Ponape. It brought only 20 sen a kilo, but the equivalent of about 25 kilo dried can be gathered in a good night. Limwăs ęn lăm was also exported; except that it is dark green with dark red-brown spots, instead of black, this could be the one mentioned by Christian as limach.

Four varieties of trepang (wărar, kămęth, kŏith, and lĭsęp) cannot be exported because they cannot be dried. When they are taken out of water they become slimy and melt like butter. Lŏngun did not "melt" but was not exported and is said to be unfit for smoking. All these varieties of trepang except the first three, which were apparently saved for export, were eaten locally by both Japanese and Ponapeans. Trepang is eaten raw by Ponapeans, with lemon and salt added after they are sliced; only the intestines of wărar are eaten. Mwăs ęn ǫlǫth, which is filled with water like a long narrow balloon, mwănęt, which is described as slimy even before being taken out of water, and sapwarang, which does not "melt," are neither eaten nor exported. Pęlęs, lŭwator, ęnip, limăikǫtǫ, and tănǫlǫth were listed by a Ngatik informant as having been exported from Ponape before the war; but these may be simply Ngatik names for some of the varieties mentioned above.

Măin and likăpĭsĭno live in the deep waters of the

lagoon and fishermen catch them by diving with spears and goggles. The others live on the reef but, except for kătŭpw, hide under the sand during the daytime and must be gathered at night at low tide. Trepang which is to be exported is fire dried like copra after being boiled in salt water for half an hour. Drying is done over a fire of mangrove wood in a shed similar to that used for copra. It takes from three to four days, after which the trepang becomes stiff, hard, and smaller through loss of moisture. The fire must be tended day and night while the drying continues. Boiling and drying must begin the same night that the trepang are caught; it is particularly important to boil limwās ẹn läm immediately so that they do not spoil.

Several forms of marine life in addition to the eels and sharks present hazards to the fisherman. A starfish (raräni) is very common, whose spines like those of two sea urchins (pąipąi and lawak) are said to be poisonous. A small crablike animal with a conical shell (likarŏngẹtik) is also poisonous, as is the lion fish (talĭẹrẹ). All these can cause pain and swelling if stepped on, but are said not to be fatal. The scorpion fish (nĕu), however, is said to have caused deaths when the wounds were not treated; one Ponapean remedy is to bind the tops of alęk (Miscanthus) together, pound them with salt or in salt water, cook them in breadfruit leaves, and place them on the floor for the patient to stand on. A quicker and more reliable cure is said to be to cut up lemons into boiling water, and soak the injured foot in the water as hot as the patient can stand.

Fishing in the old days was surrounded by sex taboos (pąlisuęthinli) and food taboos (pąlisuęthẹnmŏnga). On the night before going out to fish with seines, handnets, traps, weirs, fish poison, or even by hand, both husband and wife had to abstain from sexual relations or the fish would "know it and run away," or the fisherman would step on a poisonous sea urchin, starfish, or lion fish. When schools of fish are frightened away as a fishing team approaches the reef with a seine, the sŏuseth may turn to the others with the accusation "One of you is pąlisuęth. See the fish are very wild." Also if a man caught no fish or if he had an accident when out fishing, he might suspect his wife of being unfaithful during his absence. Since women went fishing on the reefs or in the mangrove swamps almost every day and because of the sexual taboos in connection with farming activities, there seems to have been practically no acceptable time for marital relations.

Men had no food of any kind before going out fishing, though these taboos on food are not observed today. Sexual taboos in other activities have also been abandoned, but they are still observed prior to fishing with hand nets and fish poison. Few men feel it is necessary to abstain from intercourse before seine fishing today, except when a new seine is being used for the first time. On this occasion all members of the fishing team sleep together in the feast house or in the canoe house before going out, and for two weeks thereafter. Their wives all stay together in the house of one of the men, so that there can be no question of one of the group's having broken the taboo. Joking about the sex taboos is common; for example, when a woman picks up a trepang and its insides come out all over her, her fishing companions tease her for having slept with her husband the night before.

With few exceptions, Ponapean fishing is a subsistence affair. The men go out fishing when the tide and weather are favorable and catch only enough for the needs of the family, and the women gather mollusks and fish with their small hand nets along the reef. During the period when there are high and low tides, fish are the major source of protein in the diet, but since the staple food is breadfruit or yam, no large amount of time need be spent in fishing. During the period of "no tides" women devote a larger part of their time to hunting crabs in the mangroves, while men turn to trapping, hunting, and farming.

The principal exception to this was Nănipŏn, who with his wife, his daughters, and his son-in-law, put in a full day of fishing almost every day except Sunday. They sold turtle meat, turtle shell, shellfish, and dried trepang, but they specialized in catching the large green wrass (kamăik) (Cheilinus undulatus) for sale to the Japanese and to the Germans before them. Nănipŏn himself was recognized as the most expert of the fishermen on Ponape. Within his family the usual lines of sex division of labor have been completely forgotten. His wife and four daughters dive, use the spear, and take a man's place in fishing with large seines. Some other natives had Japanese licenses to hunt turtle, and some of the out-islanders caught fish for sale to the natives employed by Military Government.

Some time before the establishment of the bonito industry on Ponape, a Japanese government-owned ship especially equipped to study deep-sea fishing came to Ponape. Most of the time at Ponape was devoted to studying native techniques of reef fishing, collecting samples, and recording Ponapean names of lagoon fish, while the ship with its crew of four or five lay idle in the harbor. It is said that the governor finally ordered them to do some work outside the reef, and they left for Kusaie. On their return they missed Ponape, ending up at Truk, where they stayed after the governor of Ponape had cabled them not to come back and had shipped on the equipment that had been left behind. The information collected by this group would be worth locating, whether it throws light on commercial fishing or on subsistence fishing.

HUNTING

The hunting of wild animals and birds in the mountainous interior of the island provides a supplementary source of protein during the periods when the tides make many forms of fishing impossible. Wild pigs (pwĭk ẹn wal) and deer (tĭa), the latter introduced in the German period, are generally brought to bay with dogs and killed with knives. A pig trap, presumably based on a spring snare, was formerly used but none of the informants questioned knew how to make it. Firearms were prohibited to natives by the Japanese and to all except the Nănmăriki (A1) by the Germans.

Wild chickens (mălęk ẹn wal) are very commonly caught with spring snares, used singly with coconut or yam as bait and surrounded by a small circular fence of twigs and leaves so that the only entrance is through an opening leading to the snare itself. A group of men may set out fifty or sixty such traps in a long line with a fence between them so that to pass by, the chickens must go through the openings that lead to the snare. These traps were still made and used.

A number of wild birds are caught with breadfruit sap (pwĭl ẹn măi) as birdlime. The fish-eating birds, părẹt, sĭk, kawălik (heron), and kasap, are caught at night when they are roosting in a tree. Birdlime is put on the end of a pole about 18 foot long. A man climbs the tree quietly and holds the sticky end of the

pole about three inches above the back of the bird so that when it tries to open its wings they stick to the pole. If the others are frightened away, he waits until they return to roost again. This kind of hunting can be carried on at any time of year, but in general the fish-eating birds are not as well liked as the fruit-eating kind.

Mŭroi (fruit pigeon), siŏk, and kiniwęth, which are fruit eating, are caught by putting birdlime on the branches of the trees in which the birds feed, so that they get it smeared over their feet and wings, lose their balance, and fall to the ground, where they are picked up by hand. These birds are usually caught on nïn trees (Ficus tinctoria) when their yellow fruits are in season. They may also be caught on papaya trees at any time of the year. Only the mŭroi and the bat (pwĕăk) can be caught in breadfruit trees, and since bats are never eaten, they are released. Air rifles are also used in hunting wild birds, particularly mŭroi, which is the best liked of all. Red parakeets (sęrĕth) and owls (likŏt, tĕap) are not eaten but are sometimes taken from the nest and tamed as pets, the former being taught to speak.

Rats and mice were eaten as late as the early part of the German period, and some were formerly tamed as pets and fed copra or yams or, when very young, coconut milk. The Ponapean rat trap, used during and after the war when steel traps were not available, was an ingenious device made from a section of bamboo. Informants were not sure how rats were caught before bamboo was introduced.

Five or more native varieties of lizards (lămwęr, limănimănisĕri, kiĕl, lipăiręr, lisesepäini), the large Japanese-introduced Saipan lizard (kiĕl ęn Saipăn), the toad (kăiru), and the snail (thĕnthĕnmosi) are not eaten by Ponapeans.

11. ANIMAL HUSBANDRY AND FORESTRY

ANIMAL HUSBANDRY

Domestic animals and poultry, which are important as sources of protein, were drastically reduced in numbers during the war. Many Japanese- and Ponapean-owned poultry and animals were slaughtered to feed the Japanese population when the island was cut off from imports, and the slaughter continued after the American occupation. Although orders to the contrary were issued, pigs and cows were killed and eaten when the plans for evacuation were announced and the Japanese knew there was no further need to husband their resources. Japanese-owned livestock were declared to be Military Government property and those that escaped destruction were assigned to natives to take care of, since Military Government had no facilities for doing so. Some of these are also said to have been killed and eaten by the natives to whom they were entrusted, but many remained in native hands. No provision was made for paying natives for their services in taking care of the animals.

There are sufficient numbers of most animals on Ponape to expect that in time their former populations can be restored. The destruction of milk cows and ducks, however, has been so great that breeding stock is required. Turkeys and geese completely disappeared some time before the war; they did not do well on Ponape.

On some of the outlying islands it is reported that the entire pig population has been wiped out, and there are no pigs even for breeding purposes. In this situation the 346 pigs now owned by Military Government can be put to good use, and if some restrictions were imposed on the importation of local breeds of pigs, it would be possible to restock these islands completely with superior breeds. Similarly the pigs of superior breeds might be exchanged for native pigs on Ponape, as milk cows were exchanged by the Germans (see below). Some form of bonus for the breeding of superior breeds and some form of restriction on the slaughter of superior breeds, plus the breeding of pigs by the U. S. C. C. for sale or exchange, would be advisable to improve the local stock. In no event should the better, government-owned, pigs be slaughtered, as was considered by one Commanding Officer in order to solve the problem of feeding Military Government employees.

One of the wealthier families on Ponape, consisting of husband and wife and an adopted daughter, together owned 50 chickens, 20 pigs, 5 goats, and 2 cows after the war. The head of the family estimated that he killed a pig about twice a month and chickens three times a week in normal times. During the American air raids, when the Japanese forbade the people to fish on the reef, it was necessary to kill 20 or more chickens in a single month.

Japanese figures for the Ponape Branch Bureau show the production of 42,933 kilos of meat, 3,054 kilos of poultry meat, 378,876 hens' eggs, 11,325 ducks' eggs, and 6,159 litres of milk in 1937. At that time there were one slaughterhouse and seven butcher shops, operating under government regulations covering sanitary conditions. Prices on Ponape are given as 3.40 yen per kilo for beef in 1932 and 1.30 yen per kilo for pork in 1937; prices of chickens and eggs are not available. Military Government prices in 1946 were 20 cents per kilo retail or 10 cents per kilo wholesale for lard, and 15 cents per kilo wholesale for goat meat. Live pigs were priced at $1.50 each for less than ten kilos, $2.50 each between 10 and 20 kilos, $3.25 each between 20 and 30 kilos, $4.00 each between 30 and 40 kilos, $5.00 each between 40 and 50 kilos, and at 10 cents per kilo for pigs weighing more than 50 kilos. Live goats sold at 8 cents a kilo. The ceiling price on hens was 40 cents each, roosters 30 cents each, and ducks 30 cents each.

Pigs (pwĩk).—Pigs have been raised on Ponape since the Native period and are important in the pattern of feasting. Pigs are generally baked, but fried pork is often served. Lard, locally rendered, is used in frying. The blood of pigs or goats, but not of cows, chickens, or dogs, is eaten after being baked in a pan on hot stones. In earlier days a shell or simply a leaf was used in preparing this dish, which is called simply "blood" (ñta). It is sometimes flavored with chopped leaves of "Red taro."

Japanese figures show 4,411 pigs in the Ponape Branch Bureau in 1925, 3,853 in 1931, and 6,810 in 1937, including those owned by both natives and Japanese. A Military Government livestock census, dated July 18, 1946, showed 2,770 pigs on Ponape island, of which 2,424 are native owned and 346 were formerly Japanese property. The distribution of the native-owned pigs by districts is very uneven, reflecting the slaughtering of pigs in those areas where the Japanese population was concentrated. Almost half (1,165) of the native-owned pigs are in Kiti District. The ratio of pigs per capita for the various districts is as follows: Kiti 0.70, Matãlanim 0.57, Sokȩs 0.26, Ũ 0.23, and Nȩt 0.16. Destruction of pigs is reported from the neighboring atolls, some of which are said to have been left with no pigs at all and to be in urgent need of new stock for breeding purposes, as noted above.

In addition to the native breed of pigs, several foreign breeds including Poland China were introduced by the Japanese. These seem to do very well on Ponape and several very large pigs, including a male and a few females, have survived. The U. S. C. C. began to call in those that were government owned in order to breed them for native use. Ponapeans have no particular preference for their native breed, and would rather own the larger and better Japanese breeds.

As has been indicated, domestic pigs are a nuisance in farming. In the Native period, crops were effectively protected by piercing the nose of a pig and inserting the midrib of a coconut leaf from which a lipwði shell (pȩlik) was suspended. This prevented the pigs from rooting and from eating vines and leaves, but was so painful that pigs had difficulty in eating even when they were fed, and some grew thin. During the German period a wire through the nose was substituted. This is sufficient to prevent "good" pigs from rooting if they are fed three times a day, but "bad" pigs root anyway. Some pigs are recognized as being more destructive than others and the very bad ones can be

controlled only by being kept fenced in. The wire nose ring does not prevent pigs from eating vines, leaves, and stalks. When it was adopted, it sometimes became necessary to build coconut-leaf fences to protect bananas, mountain apples, and sugar cane. To construct these fences coconut fronds are cut into two-foot sections that are stuck into the ground about two feet apart, and their leaves are interwoven. These fences are not sufficient to keep pigs away from yams, which must be protected by fences of stone or tin. Before the war, furthermore, most people fenced their pigs in when yam vines were growing, though in 1946 they were allowed to run free.

Except when they are fenced in, pigs are allowed to forage for most of their food. Few people feed them systematically, but only throw them scraps of food or garbage and empty drinking coconuts, which are broken open so that they can eat the soft flesh. The juice from ripe coconuts is generally saved when copra is made and fed to pigs in a wooden trough, and they are also given the crisp flesh (pär) of sprouted coconuts, which cannot be used in making copra. Bananas, Alocasia, potato and ŏmp vines, and the variety of taro (sawăn mwaramwar) that is not eaten are also used as pig food. In recent years ripe coconuts have often been brought home and fed to the pigs, but only because there has been no market for copra.

Cows (kǫ̆u).—Cows were introduced onto Ponape by the American missionaries in the Spanish period. The Japanese records for the Ponape Branch Bureau show 146 in 1925, 284 in 1931, and 613 in 1937, most of which were on Ponape and Kusaie. Large numbers were brought to Ponape during the early years of the war, with 100 in a single shipment, and it is estimated that there were 600 on Ponape alone in about 1942. Many of the cattle were used as draft animals, and large numbers were concentrated in the Nambo copra plantation in Matălanim for this purpose. Before the war the Nănipĕi brothers, Oliver and Thomas, had about 100 cows in Kiti and 50 in Matălanim. The Military Government livestock census in 1946 shows that only 68 cows were left alive, of which 52 were native owned.

Cows were used by Ponapeans both for meat and for dairy purposes. At least in Kiti and Matălanim districts fresh milk was drunk by both young and old people, and Ponapeans are now very fond of butter. In most parts of the island there was at least one milk cow for each section and in Kiti District there are said to have been as many as ten per section, not counting the Nănipĕi herds. These cows provided milk and butter in small quantities for the entire section. In addition, one native had a small dairy near the Colony and sold fresh milk to the Japanese. When Dr. Hahl, the German governor, found that Ponapeans liked and used milk and butter, he arranged to replace their cows with a black and white spotted variety from New Guinea that gave more milk. Ponapeans were allowed to trade their old cows, head for head, for new ones without any charge. Thomas Nănipĕi says that 20 of his milk cows of the New Guinea breed gave five tubs of milk a day. A still better breed of milk cows, introduced in 1937, was owned by the two Etscheit families and by the Spanish Father. In all there were at one time fifteen of this breed, one of which gave ten liters of milk a day after bearing a calf; but only one was still alive.

Of the sixty-eight cattle surviving on Ponape only a few were suitable for milking purposes, and they were not of the best breed. Fresh milk, butter, and beef can make an important contribution to the Ponapean diet, and since the tradition of cattle raising and dairying is already established, good breeding cattle should be provided to replace the animals that have been destroyed. Once they have accumulated some capital, Ponapeans will be willing to purchase milk cows, provided they are not delivered at exhorbitant costs in terms of native income. Meanwhile, credit will be necessary if Ponapeans are to purchase cows.

Not many families are interested in owning cows, because they are a pest on the ordinary small farmstead. Cows destroy yams by eating the vines, breadfruit, bananas, and other plants as well. It is impossible to combine farming on the small farmstead with cattle growing, and only the families with more than 500 coconut trees can raise cows successfully. The cows can be tethered to the coconut trees or fenced off by wires strung between trees so that they cannot get at the subsistence crops. In this way about two cows can be kept for every hectare of coconut trees (120 trees). At the same time grazing keeps down the growth of weeds and makes the task of cleaning the coconut groves easier. The combination of cattle grazing and coconut farming proved successful on the Etscheit plantation, making it possible for the laborers to clear more trees per day. The cattle do not eat the lantana, hibiscus, or the large-leafed vines, but they keep the grass short and they manure the trees. The Japanese introduced a variety of "Paddle grass" (rę̆ patil) as cattle feed, and some informants heard that pokso or "Napir grass" (Pennisitum), used in making paper, was introduced initially as a cattle feed.

The price of cattle was low before 1937, seldom bringing as much as 80 yen a head, whereas a large pig might sell for 30 yen. During the inflationary period after the American landing, when it was rumored that Japanese yen would be worthless, one native paid several thousand yen for a single cow, later regretting that he had done so.

Carabao (karapău).—Carabao are said to have been introduced to Ponape first in the Spanish period, though the Japanese figures show none in either 1925 or 1931. In 1937 there were 26 in the Ponape Branch Bureau and a great many more were imported to Ponape after that date. The Military Government census shows 54 or 60 (the total does not check with the figures by districts) of which only two were native owned. Carabao were used mainly as draft animals for plowing and for pulling wooden-wheeled carts, and most of them were in Matălanim and Nęt districts. On the Nambo plantation they were used like cows to pull cartloads of coconuts into the drying shed for cutting and were allowed to graze among the coconut trees. Carabao meat was eaten by the Japanese, but not by Ponapeans.

Horses.—The Japanese figures show no horses in the Ponape Branch Bureau in 1925 or 1931, and one horse in 1937. This horse was on the Nambo plantation in Matălanim, and later two more were imported by the Thŏng Company. Two horses were still alive, both of which belonged to Military Government.

Goats (kęut).—Goats are said to have been introduced first in the Spanish period. Japanese figures for the Ponape Branch Bureau show 766 in 1925, 1,056 in 1931, and 459 in 1937, most of which were on Ponape. The Military Government census for Ponape

Island in 1946 shows 256 goats, of which 155 were native owned and 101 which were formerly owned by Japanese. Of the native-owned goats, 84 per cent were in Kiti and Matälanim districts, and 96 per cent of the government-owned goats were equally divided between Nęt and Matälanim districts. Goat meat and goat milk are both used by Ponapeans, though the latter is less commonly used than cow's milk.

Dogs (kithi).—Dogs are said to date from the Native period, and are still used for food on rare occasions. Although they would be so used only by a very poor family, dogs are an acceptable substitute for pigs at a feast, whereas fish, for example, is not. There are no figures on the number of dogs on Ponape.

Cats (kät).—Cats are said to have been introduced in the Spanish period. They are not used as food and there are no figures on the number of cats on Ponape.

Rabbits.—A few families keep domestic rabbits that are used for food. There are no figures on the number of rabbits on Ponape.

Chickens (mälęk).—Chickens, and the eating of both their meat and eggs, are said to date from the Native period. The Japanese figures show 8,862 chickens in the Ponape Branch Bureau in 1937, and the 1946 census shows 4,172 or 4,202 (the total does not check with the figures by districts) for Ponape Island, all of which were native owned. Chickens were distributed throughout the island, the ratio of chickens per capita being 1.04 in Kiti, 0.75 in Nęt, 0.715 in Sokȩs, 0.585 in Ü, and 0.575 in Matälanim. These were only a few of some Japanese breeds of chickens. Chickens are fed regularly, the commonest food being grated coconut and papaya, although pieces of yams, bananas, and other foods are also used.

Ducks (tęk).—Ducks are said to have been introduced in the Spanish period. The Japanese figures for 1937 show 687 ducks in the Ponape Branch Bureau, but the 1946 census indicates that on Ponape Island only 12 ducks had survived, all native-owned, which were divided evenly between Nęt and Matälanim districts.

Turkeys (tąki).—There are said to have been turkeys on Ponape in the German period, but all died. None is listed in the Military Government census, and it is assumed that the 41 turkeys shown in the Japanese figures for 1937 for the Ponape Branch Bureau were on Kusaie or other islands.

Geese (kŭs).—Geese, like turkeys, are said to have been raised on Ponape in the German period, and then to have died off. They do not appear either in the Military Government census for 1946 or in the Japanese figures for 1937.

Bees.—Bees were raised by the Japanese at the Agricultural Experiment Station and in Palikir, and several hives were still occupied. Ponapeans do not like bees, but a man from Palau was taking out the honey for the U.S.C.C.

FORESTRY

The forests of Ponape yield lumber, ivory nuts, fibers, and other materials that have been exported as well as used locally in handicraft, construction work, and other activities. The wild foods growing in the forest are discussed in the preceding chapters. Japanese reports show 109 Japanese men and 16 Japanese women, and 72 native men and 2 native women occupied in forestry in 1937, as well as 3 natives in chemical industries, which may refer to the production of usęl ęn thŏng (see below) or to the manufacture of alcohol from sugar cane.

Lumber.—Sawmills are said to have been operated continuously on Ponape since the German period. During the latter part of the Japanese period, with the program of colonization and the war, they expanded rapidly. A great variety of trees are suitable for lumber, and several were highly regarded by the Japanese for cabinet work, but only a few existed in quantities sufficient for commercial production. During World War II thŏng, the commonest tree in the mountains, was cut and used extensively by the Japanese. It is regarded as a poor wood, however, because it is one of the most susceptible to termites (lŏngonmąt and lǫngŏi) and it was not used by Ponapeans for house building prior to the Japanese period. The dry-land trees most commonly used for lumber were: thŏng (Dipterocarpus, Christian[7]), specific gravity 91; känpap (unidentified); satak (Elaeocarpus, Christian); äis (Parinarium, Christian); mäi (breadfruit), specific gravity 64; kȩmä (unidentified), specific gravity 105.5; kirim, kurum (unidentified).

The best woods for house building and other construction purposes on Ponape are the termite-resistant woods that grow in the mangrove swamps. Kǫtǫ is probably the most widely used of all woods on Ponape for such purposes and served also for bridges and piling. Houses of kǫtǫ built more than thirty years before were still in good condition. Although the varieties of true mangrove äk (Rhizophora) were not millsawn, they were used by both Japanese and Ponapeans for house posts and rafters. The woods of the mangrove swamps include: kǫtǫ, kawa (Sonneratia), specific gravity 163; pŭlok (Xylocarpus), specific gravity 134.5; akęlęl (Rhizophora), a kind of äk that when aged is known as tïniyak and is very heavy, specific gravity 236; akapä (Rhizophora), a kind of äk; wäingal (Lumnitzera), specific gravity 120.

For furniture, in addition to satak, kȩma, and pŭlok, the following woods were used by the Japanese: sŏ (unidentified); kǫrę (unidentified), specific gravity 236; käsila (unidentified), specific gravity 164; isau (Calophyllum, Christian) specific gravity 192.

For boxes, the common woods were thŏng, mäi, satak, kȩmä, and isau. For tool handles luwäs is regarded as best though it is very rare. In addition to kǫrę and akęlęl, the following woods were also used to make handles for native and imported tools: luwäs (unidentified); äpwith (Macaranga); kąmau (Cynometra); ngï (Pemphis acidula); marąpwęnsęth (Heritiera littoralis), specific gravity 164.4.

The Japanese collection of samples also contains specimens of two other woods in which they were apparently interested: kalak (unidentified), a hard wood

[7]Where indicated in this way, identifications are based on F. W. Christian (1899a), The Caroline Islands. Other identifications are by Fosberg. Specific gravities are based on a collection of Japanese samples at the Experimental Station, some of which were mislabled in terms of Ponapean names, according to Ponapean carpenters; specific gravities are given only where the name on the sample was confirmed by informants.

with an attractive grain, probably used in cabinet making, specific gravity 188; kalãu (Hibiscus tiliaceus) the most widely used of all woods on Ponape but available in small sizes only, specific gravity 90. The Japanese sample is dark in color and is said by native carpenters to be old and heavier than fresh-cut pieces.

Japanese records for the Ponpae Branch Bureau show that a total of 6,279 cubic meters of lumber was cut in 1937, valued at 7,274 yen. Of this more than half is listed as "mangrove," 3,372 cubic meters worth 3,864 yen, and "miscellaneous" accounts for 2,868 cubic meters worth 3,361 yen. The balance is accounted for by 37 cubic meters of breadfruit valued at 142 yen, and 2 cubic meters of red sandalwood valued at 7 yen. In the previous year lumber exports were valued at 2,075 yen. Koto, the highest priced lumber for most purposes, sold at 6 yen per chipo (6 feet x 6 feet x 1 inch).

In 1936 a program of conservation and reforestation was announced. The grounds of the Experimental Station contain small stands of mahogany, sandalwood, and rosewood, which the Japanese may have intended to use for this purpose. The felling of trees both in the mountains and in the mangrove swamps was prohibited by the Japanese, except with a license or on privately owned land, but there is no evidence that reforestation was actually begun. On the contrary, the rapidly increasing Japanese population and later the military preparations for the defense of Ponape meant that even attempts to restrict the cutting of trees had to be abandoned. Akelel was used for telephone poles; akapã was used for water defenses against American landing craft; and akapã and coconut were used for underground air raid shelters. As a result, the prewar forest resources of Ponape have been depleted to an undetermined extent, and it is impossible to estimate present potentialities from past production. Throughout the mangrove swamps, where the most useful trees grow, cut-over areas are to be seen.

The mill of the largest lumbering company, Nansan, used power supplied by the hydroelectric company, with which it was financially affiliated. This company brought in thõng from the mountains on a portable narrow-gauge track, and also floated logs to their mill. The technique for lumbering in the mangrove swamps is limited by the high specific gravities of the woods. They can be floated to the mill only by buoying them up with drums or bamboo. Usually they can be moved out into the lagoon and then towed to the mill, but only at the very high tide that occurs with the full and new moon. Nansan shipped some logs to Japan and also talked about making lumber from logs imported from New Guinea.

The Nansan sawmill and several smaller and less well equipped ones, some of which were for military purposes, still remained on Ponape. A small diesel-operated mill was located in Wąnę, Kiti District, and another in Palikir, Sokõs. Licenses to operate some of these saw mills have been granted to Ponapeans, and a small amount of lumber has been actually produced, using abandoned logs cut by the Japanese. Some of the logs were badly worm-eaten, but the record of production of the sawmills, even considering the state of the equipment, the need for replacements, and the availability of electric power, has not been disappointing. There is need for technical advice, particularly in programming the cutting and milling schedule, if the present manager of the main sawmill is to operate efficiently. The mill in Palikir, which was licensed to a cooperative, perhaps showed the greatest promise of success, although only three or four days a week were devoted to logging and sawing.

Because the equipment of the sawmills is in such bad repair and completely primitive with regard to the safety of labor, the importation of a small American plant of modern design, for which spare parts can be obtained readily, is justified. The U.S.C.C. was attempting to obtain a mill capable of handling 12,000 board feet a day from military surpluses in the area, and equipment to manufacture furniture on a small scale. This project should be encouraged, but before the plans to use Ponape as the source of supply of lumber or furniture for any part of the mandated islands can be put into effect, a survey of the present forest resources is needed.

The labor used in lumbering and milling was largely Japanese, and although some Ponapeans were employed, they did not often have the opportunity to learn the technical aspects of operating a sawmill. Although there is no reason to doubt that they will be able to learn this rapidly, some technical training and assistance may be required. Okinawans are described as very skillful in lumbering and able to distinguish between sound and rotten koto trees without having to waste time and money felling them.

The Thõng Company (Tong Kaisha) exported thõng wood to Japan in blocks 6 feet long, 3-1/2 inches thick, and 4-1/2 inches wide. This company did its own logging with Okinawan labor and is reputed to have purchased all the thõng trees on Oliver Nãnipẽi's land for 10,000 yen. Nansan and several other companies also shipped thõng to Japan during the war. One of the two Etscheits says that all the thõng was used for rayon, whereas the other says none was used for rayon, but that it was used for the manufacture of geta sandals. The Thõng Company also made a few shipments to Japan of hibiscus in diameters of from 1-1/2 to 2 inches, but the use to which it was put is not known.

Charcoal and firewood.—Charcoal was made by the Japanese from akapã and from coconut shells. Japanese reports list the price of charcoal on Ponape as 2 sen a kilo in both 1932 and 1937. Some coconut-shell charcoal is reported to have been shipped to Japan during the war for military purposes. For the woods commonly used as firewood see chapter 4.

Fibers.—A number of fibers from wild and domestic plants are used in the Ponapean economy and were also exported to Japan. The growth of the export industry in fibers equaled or even exceeded the development of the bonito industry in its rapidity of expansion. The 3,504 yen worth of fibers exported from Ponape Branch Bureau in 1937 was made up of 1,180 yen (1,256 pounds) of cotton and 2,324 yen worth of unspecified "rope, cordage and thread." In 1937 the figure had increased to 26,467 yen, of which 24,927 yen was exported to Japan from Ponape, 1,300 yen from Kusaie; 240 yen was exported to other countries. By 1940 the exports were valued at 825,996 yen, more than double the value of copra exports, of which 125,708 yen was in coconut leaf fiber. The largest increase was probably in hibiscus bast and coir. With the exception of coir, the income from fibers went almost exclusively to Ponapeans. Exports of rope and fiber continued to expand until all exports to Japan were cut off by the American submarine blockade.

Hibiscus (kalãu) is very widely used as a source of fiber. Strips of hibiscus bark (kilin kalãu) are used

for tying fruit and vegetables to a carrying pole, tying up small packages, tying baskets shut, tying newly planted crops to supporting poles, or for any of the ordinary purposes for which we would use a piece of string. Strips of untreated bark tied together (kăn kalău) are used in training yam vines into the tree tops. Hibiscus bast (sŏpą) is made by men soaking the bark in brackish water for four or five nights and then peeling and drying it. It is used for men's skirts and was formerly used for the old-style shawl (lithinimmwar), and it is twisted into a twine (ñgkǫl) used in many fish nets. Hibiscus bast (thipęn kalău, kŏt) that is separated without the long period of soaking is used by men to squeeze coconut cream and kava.

The treated hibiscus bast (sŏpą) was exported to Japan in large quantities for rope manufacture. This enterprise was begun by the Hibiscus Company but in time a number of companies, including Carlos Etscheit, were shipping it. At first the price was 5 or 6 sen per kilo, but soon it rose above the price of copra, and as much as 20 sen a kilo was paid to native producers. Carlos Etscheit heard that the price in Japan increased during the war from 800 to 1000 yen a ton, and the price to native producers was raised to 30 sen a kilo and was going higher with the departure of every ship to Japan. Leo Etscheit estimates that an average of 150 tons were loaded on every outgoing vessel after 1936, which gives an annual export of about 2500 tons a year. Another source estimates exports at 800 to 1000 tons a year. Hibiscus bast was produced almost exclusively by Ponapeans, and its export provided a source of income of major importance. At 20 sen per kilo, 2500 tons would be worth 500,000 yen, or roughly equal to the value of copra exports from the Ponape Branch Bureau. Sŏpą was also used locally by the Kohatsu plantation for a time in making bags for the export of cassava.

The fibers (ānkot) from the husks (thĭpanith) of drinking coconuts are used by Ponapeans to make sennit (pwĕl). Sennit is the only twine used for lashing canoe parts. It is also used in preparing tobacco and tying some fishnets, and was exclusively used in housebuilding before the introduction of nails. The husks are soaked for two weeks in brackish water and then beaten with a mangrove stick and laid in the sun to dry. It is estimated a man can pound an average of 50 husks in a day and can twist about 50 yards of twine a day, although skillful people can do twice as much. Large, artistically wound balls of sennit are a store of wealth that can be traded for pigs. The export of coir, using the fibers from husks of ripe coconuts that had been discarded in the manufacture of copra, was begun in the Colony by two Japanese, one of whom had formerly been a local director of the Nambo Company. Later several companies including Nankosha and perhaps Nankosuesan engaged in the trade. Another plant was located in Ū District in connection with a copra press. In Wąnę, Kiti District, both coir and rope were produced, using a simple rope-making machine, in connection with a hand press for coconut oil. Leo Etscheit estimates that 175 tons of coir were exported to Japan on each ship, giving 2,500 to 3,000 tons annually. Another source estimates exports at 500 tons a year. One company prepared coir by soaking the husks in water; others steamed them in boilers and pounded them.

Coconut-leaf fibers are used in making hats, belts, and men's skirts. The leaves are broken from the frond and folded double, and the outer edges are cut off about a quarter of an inch from the midrib by drawing them down over a needle or a "razor" of alęk (Miscanthus). The inner section with the midrib may be used in making fans (tānir) or women's baskets (pwatathau). The outer or under surface of the leaf edges is then peeled off by drawing the leaf under a knife, and discarded. The smooth inner surface is placed in water until the work is completed, then boiled for about ten minutes to make it white, and then dried in the sun. This method of preparation was learned from the people of Mokil in the German period. The old-style coconut skirts, although scraped smooth with a kŏpil shell, were much stiffer than the ones today.

Coconut-leaf fibers prepared in the new way were also exported to Japan for the manufacture of panama hats. No exports of coconut-leaf fiber were reported in 1936, but 7,018 pounds, valued at 125,708 yen (17.9 yen per pound) were shipped to Japan in 1940. Annual exports are estimated locally at about five tons. It was purchased in small bunches of 40 or 50 strips at 10 sen a bunch by a native who held a monopoly of the export trade. This same man is said to have planted real panama fiber plants in the Colony which grew very well.

The fabriclike coconut "cloth" (inipal) growing about the trunk of the tree is used by women as a squeezer (kŏt, kotęell) for coconut cream and as a wrapper for all native charms or medicines. It was used occasionally locally by the Japanese as well as natives as a strainer. Coconut leaves are the most commonly used material for basket making, though Ponapeans sometimes substitute the palm leaves of kathai and kotopw palms when gathering wild food or hunting in the mountains. Coconut leaves are occasionally used for thatch, but the standard material for this purpose is the leaves of the ivory-nut palm (ǫs).

Fibers (kimwār) are extracted from aerial roots of the pandanus (kipār, thāipw), which is used for food, and of another wild pandanus (mwathal), which bears no edible fruit, for the manufacture of men's skirts and the tassels on the carved dance paddles. The dried leaves (pĭt) of both varieties are also used for the new style of mat (lĭrop), but only certain varieties of the kipār or thāipw have leaves long enough for the old mats (lŏs) or for belts, hats, and baskets.

Banana fibers (mąt, kisinimąt) were formerly used to make belts (thŏl) and sails and are used today for some men's skirts and fish nets. The best varieties for this purpose were prĕsil and ŭt ęn wāi, but today kalatān or lakatān is the most widely used. The fibers from the plant which the Ponapeans call "rope banana" (utisąl), and which is probably abaca, were manufactured by natives into a rope (săl) for canoe rigging. Hand-operated machines, copied from a specimen imported from the Philippines, were manufactured locally of wood and iron to twist the rope, and in the Spanish period all rope was locally made in this way. This rope was also sold to the Germans, but the Japanese were said to be unaware of this industry and to have imported rope until the war, when they had to rely upon the inferior rope made of coir.

Pineapple fibers (mąt, kisinimąt) were also used sometimes to make some hand nets for fishing and the old native belt (thŏl). The Nantaku Company is said to have attempted sisal production unsuccessfully before turning to pineapples, and a few sisal plants still grow on Ponape. The fibers of a seaweed (ǫlŏth) that grows on the silt-covered parts of the inner reefs are also used for hand nets (năik) for fishing.

Kapok trees, which are known as "big cotton" (kọtin lauth), and cotton plants, known as "little cotton" (kọtin tikitik) or "short cotton" (kọtin motomot) have been cultivated since their introduction in the German period. Both are planted by women, in small holes about two inches deep and two inches in diameter, dug with a knife. Two kapok seeds or four cotton seeds are dropped in each of the holes, which are irregularly spaced. Cotton is grown only on a small scale, and kapok trees are seldom planted in groups of more than five or six. Cotton and kapok are ginned in a tin can. A piece of Miscanthus (alẹk) two feet long, to which a four-inch crosspiece is tied two inches from the bottom, is put in the can and spun rapidly between the palms of the hands until the seeds have fallen to the bottom.

The only Ponapean use for both kapok and cotton is in the making of pillows, which were traded to the neighboring atolls and even to the Marshalls and which were sold to the Japanese. The Japanese were very eager to get pillows in place of their wooden sleeping blocks, and they paid 7 yen each before the war for locally-made pillows. The Japanese also manufactured a thick homespun cloth either from native kapok or from cotton or from both on a wooden machine, that was used for making trousers during the war. They also used kapok and cotton seeds, which are not used by Ponapeans for any purpose, for soap manufacture. Cotton was also exported in small quantities. During the war the Japanese began to plant cotton, but the plants had just reached a height of one foot when the Americans arrived.

The bark of the nïn plant (Ficus tinctoria) was formerly used as a thread for sewing women's bark cloth wraparounds (maimai), and is sometimes used in the place of hibiscus bark for tying packages and other things. It is said that on the atolls nïn bark is used in the same way that hibiscus bark is used on Ponape, but on Ponape nïn is of minor importance. Some nïn bark was purchased by the Japanese paper factory, which was at least experimenting with it as a source of paper pulp.

Dyes and Tannin.—Turmeric (ọ̈ng) is used for painting the body and for dying skirts; variety (a) (see page 111 above), gives a reddish dye, whereas the others are yellowish. The bark of the root of Morinda citrifolia (wẹ̈ipwul), mixed with burned shell, and the kernel of the nuts of karara both give dyes that are redder than turmeric. A black dye was made by mixing the scraped bark of the aerial shoots of mangrove (äk) with lamp black from burning copra, or by mixing the scraped bark of the sprouts of kọtọ with a black mud.

The bark of both akẹlẹl and akapä was bought by the Japanese for export as a source of tannin. The Japanese also used some of the bark locally to make a liquid in which to boil their fish nets, but Ponapeans did not adopt the practice. The trees were cut in six-foot lengths, pounded with pieces of wood until the bark was loosened and fell off, and the bark was then dried in the sun. Drying might take as little as a week if there was sun every day. The bark was then packed in copra bags for shipment. All the mangrove-bark production by Ponapeans is said to have been in Kiti District, though the Japanese themselves operated in other parts of the island. The trees selected were three inches or more in diameter, and lengths of less than six feet were accepted. Nambo Tannin was the only company to engage in this trade, and Leo Etscheit estimates their annual exports at between 135 and 170 tons a year.

Drugs.—About 1935, Wakamoto, a large Japanese drug company, established a branch on Ponape for the export of "thọ̈ng testicles" (usẹl ẹn thọ̈ng). These are found lying on the surface of the ground near decaying thọ̈ng and karara trees and seem to be accumulations of starch from which mushrooms later sprout. They were gathered in the forest, peeled, cut into slices about half an inch thick, sun dried, and bagged for export to Japan. Wakamoto had some employees of its own gathering usẹl ẹn thọ̈ng and appointed a Ponapean, Lucas, as their representative to buy from all native gatherers. Lucas says that his own exports averaged 1,000 tons a year before the war, when he bought usẹl ẹn thọ̈ng at 18 sen a kilo. Even without the unknown amount gathered by Wakamoto's employees, this meant an annual income of 180,000 yen a year to the native population. Lucas was told that usẹl ẹn thọ̈ng were used in Japan for the manufacture of face powder; on the other hand Carlos Etscheit heard that they were made into a powder for stomach disorders.

Wakamoto also purchased and exported kava which was manufactured into black pills for the cure of gonorrhea; some of these pills were reimported and sold on Ponape. Informants did not know whether Wakamoto grew any medicinal plants on a commercial scale, but at the Experimental Station benzoin, cajaput, coca, ipecac, jaborandi, jalap, stropanthus, white sandalwood, Tolu balsam, and Peruvian balsam were tried and derris root (ụ̈p kitik) was also grown.

Derris root (ụ̈p) is used by Ponapeans as fish poison. Three varieties are recognized, ụ̈p ẹn Ïap ("Yap fish poison"), which is best liked; ụ̈p kitik ("rat fish poison"), the commonest, which was identified by Fosberg as Derris elliptica; and ụ̈p pẹth. Any of these vines may be called "fish poison" (ụ̈p) or "fish poison vine" (säl ụ̈p), and all are said to date from the Native period. All grow wild on Ponape, though ụ̈p ẹn Ïap is also cultivated. During the Japanese period a fourth kind of fish poison was introduced from Palau, ụ̈p ẹn Pälau ("Palau fish poison"). This is made from the leaves of a bush and is said to be the strongest of all fish poisons, but it is not liked because it changes the taste of the fish. Only a few people cultivate it and it does not grow wild. Barringtonia asiatica (wï) occurs commonly on Ponape and some informants have heard that it was used as a fish poison in olden times and that it is still used to catch small octopus today. It is rarely used, however, and some informants were completely unaware that it could be used for this purpose.

Many of the plants and trees, wild and cultivated, are used in native medicines.

Other forest products.—Ivory nuts from Coelococcus amicarum (ọ̈s) have for a long time been an export from Ponape. Japanese figures show that 230.5 metric tons valued at 19,818 yen (8.6 sen per kilo) were exported from Ponape Branch Bureau in 1936. Native estimates place Ponape production between 200 and 300 tons a year, but Leo Etscheit says that exports after 1937 were far higher. Ivory nuts were purchased from native producers at 6 sen a kilo after they had been shelled and scraped for export. Two kilos of ivory nuts brought as much income as one kilo of copra, and required far less work to produce; although they were unimportant in the economy of the island as a whole, many families in Kiti District, where more than half the trees on Ponape are said to be located, relied upon them for extra income. The competition of plastic buttons will probably prevent the import of

ivory nuts to the United States, but the possibility of exporting them to Japan or China, where there may be a market for low-grade buttons, should be explored.

A small hand-operated machine for the production of buttons from ivory nuts was operated by a Japanese man in Kiti district before the war. The machine was described as a combination of a simple treadle-operated jig saw to slice the nuts and a simple drill press to cut out the buttons. The possibility of procuring such a machine from Japan should be investigated. A native button-manufacturing setup could supply utility buttons for the local market at much lower prices than those charged by the U.S.C.C.

Rubber (răpa) trees were introduced in the German period, when a number were planted on the Etscheit plantation and about 500 on the Nänipĕi land in Kiti District. The trees have grown well and the sap flows freely, but no rubber has been manufactured or exported. The trees were too young for the Germans, who had assisted in their introduction, to experiment in rubber production, and Japanese attempts failed. It is not known whether this failure occurred because the Ponapeans had not been properly trained in rubber tapping or because, as the Japanese are reported to have said, there was too much water in the rubber. During the war the Japanese discussed the possibility of using breadfruit sap as a rubber substitute, but no actual experiments along these lines were reported.

In the native economy, kalău or hibiscus is one of the most important trees. Three native varieties are recognized by Ponapeans. One, the name of which was not recorded, is used only for the outrigger floats and the heavy crossbeams of canoes. The second (pĕtakai) which was identified by Fosberg as Hibiscus tileaceus, is used only for canoe paddles. The third variety (likithal), is used for many other canoe parts, for the handles of certain throwing spears and fish nets, for floats of seines, and for breadfruit pickers, as well as for men's cooking tongs and fire spreaders, the fire plow, and breadfruit knives, model canoes, house rafters, carrying poles, and for all hibiscus bast and bark. In addition, likithal leaves are used as a native tea and its flowers are worn in the hair.

Ixora carolinensis (kătiyeu) is used for certain outrigger attachments, diving spears, digging sticks, breadfruit picker parts, dip nets, and, formerly, for fish traps. Either Ixora or kănipanial are used for dance sticks.

Miscanthus (ălĕk) is used for canoe platforms, flower pickers, drying trays for copra and trepang, in a children's game (păi), in preparing palăi, and in making thatch roofs. It was formerly used for house floors and walls, and as a razor for shredding coconut leaf fibers and for cutting umbilical cords.

Bamboo (pări) of a large variety that grows to three inches in diameter was first introduced in the pre-Spanish period. This is used to float heavy logs, for rafts to carry stones and coral, in making rat traps, to protect sprouting coconuts from rats, as a water conduit, and sometimes in place of bottles and of metal eaves. Two smaller varieties that grow to about two inches in diameter were introduced in the German and Japanese periods. Of these smaller varieties, the former, which is longer, is sometimes used for canoe masts and booms, for breadfruit pickers, and to train yams. The latter is sometimes used for fishing spears, and by the out-islanders for fish poles, which are not used by Ponapeans.

Both the pre-Spanish and the German varieties of bamboo are cultivated and do not grow wild. Six-foot cuttings are planted at any time of year in the bottom of a hole a foot deep and a foot in diameter dug with a digging stick, or a small plant is transplanted. Most families do not grow bamboo, and all plants of the Japanese variety are left from former Japanese plantings.

Ilangilang (pŭr en wăi, săir en wăi) is cultivated for its flowers, which are used for garlands and perfume. It is planted at any time of year by women in small holes about two inches deep and two inches in diameter, dug with a knife. It was introduced in the pre-Spanish period and the German traders used to exchange soap and other items for the flowers, which were exported for the manufacture of perfume. The wood of the tree is also commonly used for dance paddles, although karara can also be used.

The other plants and trees growing wild in the forest that are used by Ponapeans are too numerous to mention; for the woods used for canoe bodies and other canoe parts, see chapter 4.

The chief items of native handicraft purchased after the war for the souvenir trade have been grass skirts of various fibers, belts, cigarette cases, hats, baskets, fans, a few mats, tortoise-shell combs, watch bands, belt buckles, and rings, and some model canoes. Coconut-leaf skirts, which the Ponapeans regard as the best, were not produced in quantity because, in demonstrating the size and thickness of skirt he wished, the U.S.C.C. representative held up a skirt made of hibiscus bast and said, "This is the kind we will buy," meanwhile pointing to coconut-leaf and banana-fiber skirts and saying, "Don't bring any more like that."

The Ponapean dance paddle, which is attractively carved with fine incised geometric designs, has promise as an item for the souvenir trade. Some of the baskets of ithănwal, a rattanlike forest creeper growing in the treetops, also have possibilities. The simple Ponapean fan (although far less spectacular than the Marshall-type fans or those made of tortoise shell with pink, green, and white feathers) is of a much better functional design and is more attractive to those who have a real interest in native handicraft. In general, Ponapean handicraft is inferior to that of the atolls, like Mokil for example, where there is better pandanus for mats and baskets and where the workmanship is better. Small amounts of handicrafted articles were purchased by the Japanese, who provided some training in their manufacture.

12. CONCLUSION AND RECOMMENDATIONS

POLICY CONSIDERATIONS

The entrance of the United States into Ponape and the other Japanese islands of the Pacific has been the result of what may be called a historical accident. These islands were not taken because they themselves were desired as a part of a program of territorial acquisition or colonial conquest, nor because of any grievances against the Micronesian peoples for hostile acts toward the United States. Their conquest was entirely incidental to the campaign to defeat Japan and because they lay in the path leading to Japan itself.

Axiomatic as this fact may be, this has sometimes been forgotten by Americans in the Pacific. It is not uncommonly argued that these islands, their resources, and their peoples are rightfully ours by virtue of conquest and that they belong to us for us to do with as we will, because American blood was shed in occupying them. Ponape was captured from the Japanese, not from the Ponapeans, and since we do not take the position that Germany and Japan, our former enemies, are ours by right of conquest, we can hardly take it with regard to the Ponapeans, who were primarily onlookers in the war.

The recommendations made in this report are based on the assumption that if the United States stays in the Caroline Islands it is for military purposes only, and not because we desire to exploit the resources or the peoples of Micronesia for our own gain or to recover from these islands a part of the costs of the war against Japan. If this assumption is correct, the course is clear.

Whatever resources the islands have will be developed for the benefit of the native inhabitants, and will not be regarded primarily as new opportunities for American business. Whatever costs are necessary to insure the Ponapeans a decent standard of living, at least equal to what they have known under the Japanese, will be considered as one of the costs of national defense. If America insists on holding these islands for military reasons, the American people have assumed a responsibility to the native peoples that cannot be escaped except by giving up the islands themselves. The financial part of this responsibility, where subsidies are necessary, is in a sense one of the costs of maintaining a string of island fortresses. If the islands themselves are essential to national defense, the costs are a legitimate military expense.

PROPOSED DOMESTIC ECONOMY OF THE FUTURE

The standard of living on Ponape in the future, like that in the past, will continue to be based on a combination of subsistence goods produced for local consumption and imported goods purchased with proceeds from commodities produced for export. The subsistence economy, although seriously disturbed by the Japanese program of forced labor, is already well on its way to recovery as a result of the unassisted efforts of the Ponapeans themselves. The export-import trade, on the contrary, was completely disrupted by the war with the result that imported goods disappeared and the standard of living fell to a level almost unrecognizable in terms of prewar conditions.

Compared to the other parts of the mandated area, Ponape and, particularly, the outlying islands in the Ponape Branch Bureau, can be described during most of the first year of American occupation, as having had no capital, no income, and no imported goods. Before there can be a return to the prewar standard of living both phases of the commercial economy must be reëstablished. Imported goods must be supplied in adequate quantities to satisfy the requirements of Ponape; and Ponapeans must have some way of earning the money with which to buy them.

This means the reëstablishment of the copra industry, upon which the commercial economy of Ponape has been based for many years. Although the resources of the island make it possible to look forward to the development of a more diversified economy in the future, for a number of years, and particularly during the period of reconversion, the economic fate of Ponape, like that of the less favorably endowed atolls, will be decided by what is done about copra. Copra must be the foremost and primary concern of the administration.

A single individual owns 37 per cent of the native-owned, bearing, coconut trees on Ponape, including Ant and Pakin (and perhaps 25 per cent of the total number including the former Japanese plantations), but the remainder are widely distributed. German and Japanese economic policies resulted in the planting of coconut trees on almost every farmstead. Money from the sale of copra will be shared by every district and by every family, excpet the landless families, who present a special but not insurmountable problem. It will provide for a far larger proportion of the population than trepang, trochus, bonito, ivory nuts, fibers, drugs, handicraft, wage labor, or any other enterprise in the immediate future.

By supplying land to the landless families and reestablishing the copra industry, all families on Ponape can be provided with a source of income. Whether this income is adequate to restore the standard of living to prewar levels depends on the relationship between the cost of imported items and the price paid for copra. Every effort should be made to deliver imported goods to the Ponape market as cheaply as possible, but if American goods are to be used for any considerable part of the supply, there is no possibility of being able to match prewar Japanese price levels, even when quality is taken into consideration.

The prewar purchasing power of the yen, as compared with current prices in the U.S.C.C. stores, was about one dollar. To meet this difference, either goods will have to be sold below cost or the purchase price of copra will have to be raised accordingly. If it is not met in one of these two ways, the prewar standard of living cannot be attained regardless of the quantity of goods offered for sale in the stores.

Subsidization in some form is inescapable. For ease of administration and accounting, it would seem preferable to subsidize copra prices rather than to adjust the prices of a variety of imported goods. The prewar

price of copra in the outlying districts was 12 sen per kilo or 120 yen per metric ton. Until the cost of imported goods can be reduced by the various countries of origin, or by other means, it is recommended that the price of $120 per metric ton ($109 per short ton) be paid throughout Ponape. The costs of transport to the Colony for export should be borne by the purchaser. This is a large increase over $40 per short ton, but the total cost for the Ponape Branch Bureau would be only an additional $228,000 per year, assuming full prewar production of 3,000 tons annually. This cost is not large compared to other costs of administration in the area, and full production will not be achieved for several years. There is already evidence that it will be impossible to keep the price as low as $40 per ton when copra is resold at $120 per ton. As cheaper goods become available or as new sources of income are developed subsidies can be reduced. Shared among the Bureau's population of about 9,500 this subsidy represents $2.00 per person per month at the maximum. This amount is not large enough to justify fears of disastrous inflation.

In some quarters the bogy of inflation has been seen in every move to increase the amount of money in native hands or to raise native wages and the prices of native produce. Prices of imported goods are already disproportionately high, although the amount of money in circulation has been only $4.03 and the average daily income only 1.5 cents per person on Ponape, and far less on the outlying islands.

It is difficult to believe that anyone could seriously maintain that Ponapeans should be restricted to their present per capita wealth, or income. Maladjusted prices are not a danger to be feared and avoided. They already exist and have existed ever since American prices were established for imported goods. Where a man could formerly buy a shirt and trousers with the return from 42-1/3 pounds of copra, it now takes 187-1/2 pounds (at $40.00 per ton). The cash equivalent of the daily wage—1.60 yen in 1940 could buy 320 cigarettes; today it buys 80. A package of ten boxes of matches, which formerly cost 1.25 cents, now costs 15 cents.

The disparity that exists between native wages and produce prices, on the one hand, and the present costs of imported goods, on the other, must be adjusted, either by raising the former or lowering the latter, as a prerequisite to the restoration of a normal peacetime economy. There is no basis for viewing this adjustment with alarm because it represents "inflation" or "deflation."

The future price structure of local produce and wages should be based upon the price set for copra. Wages should be allowed to adjust themselves to copra prices as indicated in chapter 7, and the prices of bananas, chickens, crabs, breadfruit, yams, and other commodities should be allowed to adjust freely in a similar manner. Most families produce sufficient local foods for their own use. There is no basic shortage of these commodities for local consumption. The removal of price ceilings should do no more than permit a normal adjustment of the present disparity between their prices and the high cost of imported goods. If wages are allowed to increase by similar means at the same time, there should be no hardship for the one group who will be affected by an increase in the cost of local produce, the wage laborers. Price ceilings on imported goods, which are scarce, should be retained and enforced. Price ceilings can be reimposed on local produce if they should show evidence of abnormal inflation.

In the future there will be fewer opportunities for wage laborers. Smaller numbers of native laborers will be required by government and by private enterprise than were required under the Japanese. This will create a problem for some of the families formerly dependent upon wages as a source of income, but if a sound economy is developed most of these can be taken care of if they are provided with land adequate for subsistence farming and copra production. With the present population, there is no need for families to be without land on Ponape. Granting landless families title to unoccupied district lands will ultimately provide for their economic needs, but for about ten years, until they can plant coconut trees and bring them into production, they will be without income. Some families can be provided for by being allowed to return to their former farmsteads that they were forced to sell to the Japanese. But where the coconut trees have been destroyed, or where for other reason families have no land and no coconut trees to return to, landless families should be permitetd to take, as their own, parts of the former Japanese copra plantations.

The problem of these two plantations in Matälanim District and on Pakin Island has been referred to previously. From one point of view they represent an economic asset from which the United States could realize something to offset the costs of administration of Ponape, if not the costs of a small part of the war. Money, time, and energy were invested in the plantations by the Japanese. They could be sold or leased to outside interests and it would be foolish to expect Ponapeans in their present financial position to match outside bids if the plantations were put up on the open market today. It is doubtful if they would be able to bid successfully, either as individuals or as a group, for many years to come, and the present state of the plantations, after four years of neglect, makes immediate action necessary if any value is to be recovered.

For the plantations to be operated by outside interests, either through lease or through sale, a large force of native wage labor would be required. There are serious objections to recruiting contract laborers from other islands on a large scale, and once the native copra industry has been reëstablished, it is doubtful that an adequate force could be recruited locally without a violation of the principles of a free labor market as outlined in chapter 7. Since there would be no justification for paying subsidized prices for plantation copra, plantation wages could not very well be high enough to attract Ponapeans freely from their own farmsteads. Any company that had invested in the plantations would be at least tempted to offer special privileges not available on the open market or to exert pressure in recruiting in ways that cannot easily be controlled by legal regulations, even if it were not tempted to try to keep landless families landless.

From a second point of view these plantations represent an economic asset to the island and the people of Ponape. Copra from the Japanese trees can be used to increase their income and standard of living. In this way the plantations can contribute indirectly to the cost of administration by reducing the need for subsidization and for jobs created to make work.

It is recommended that these plantations be opened to the Ponapeans and out-islanders on Ponape on a homesteading basis. Outright title to the land reclaimed should be granted after two or three years, with the understanding that title will be given only to land actually cleared and trees actually worked.

With this provision there is no need for any payment for the land, and any charges or fees should be kept to a minimum. The division of the plantations should be supervised so that all claims are recorded, to see that insofar as possible adequate land for subsistence farming is included in each farmstead, and to prevent the division of the land into plots that are uneconomic in size, shape, or location. Otherwise the natives should be allowed to choose the trees they like, both with regard to number and location according to the following system of priorities.

On Pakin Island the first choice should be given to the landless out-island families, who have a tradition of atoll life. In Matälanim District, the families whose lands border on the Nambo plantation should first be given the opportunity to extend their farmsteads into the plantation area, and landless Ponapean families should be given second choice. Thereafter any family on Ponape that wishes to take a new farmstead or to acquire additional land should be allowed to do so, on the understanding that it will work the trees with its own labor.

These steps should provide economic security for the present population of Ponape, but probably will leave large numbers of trees unclaimed. Provided that the Ponapeans themselves officially approve, natives from neighboring islands where land is scarce may be given the opportunity to immigrate and take farmsteads.

Cooperatives, native companies, and individual natives finally may be permitted to take trees to be worked with hired labor. This will provide some opportunities for casual labor of the type in which the Ponapeans are interested, and for contract labor by resident outislanders. It might also be justifiable to allow the recruitment of tenant farmers and contract laborers by native employees on an experimental basis to keep bearing trees alive. The evidence seems to indicate that this form of employment was satisfactory in the past, but direct observation is the only way to make certain.

It is entirely possible that many trees will still be left to die. If the plantations are considered as an asset to the United States, this represents a loss. If they are considered as an asset to the island and the people of Ponape, this is not so, for the plantations are an asset, in this sense, only so far as they contribute to the Ponapean income and standard of living. Trees in excess of the productive capacity of the native labor force, when viewed in this way, are not an asset. Even in the former sense trees could not be "saved" by foreign-operated companies if they depended only upon native labor to work them.

Experience has shown that native populations that have been divorced from their land, either by its alienation to foreigners or by the attraction of wages, are left at the mercy of factors beyond their control. In colonial areas, where economies are undiversified and enterprises frequently monopolistic, a depression may shut down the two or three major employers, leaving wage laborers no place to turn. Where natives still have their land and have not "risen above" native foods and the old ways of farming, however, international crises can be weathered without real suffering.

The history of Ponape is a case in point. Before the war the standard of living fluctuated with copra prices, but even the last depression caused no real hardship. Even complete economic isolation during the last years of the war and the first year of peace did not cause starvation or serious hunger. Ponapeans who have not been divorced from their land also enjoy a degree of economic independence that permits them to choose between accepting wage labor, producing cash crops for export, and growing subsistence foods. The Ponapeans enjoyed this freedom of choice in the past until the Japanese introduced forced labor, and the difficulties of American officials in increasing the native payroll is evidence that they are still able to exercise it at present.

For these reasons, and because of the wishes of the Ponapeans themselves, the economy of the future should be based on small, privately owned farmsteads with the native in the role of entrepreneur, instead of on large plantations where he is employed as a wage laborer. Through both their statements and their past actions Ponapeans have shown that they are interested in wage labor only as a subsidiary form of income and not as a livelihood. The most appreciated feature of American rule, in contrast to that of the Japanese, has been the fact that Ponapeans have again been free to work their own farmsteads. Regardless of the methods of recruiting or the wages paid, the former Japanese plantations if sold or leased to outsiders would, if they were to succeed, create a class of wage laborers dependent upon employment for a livelihood.

It should be the Administration's policy to keep its own requirements for contract laborers to a minimum. Both government and private enterprise should rely as much as possible upon casual laborers, who may be recruited in such a way as to provide a fairly constant labor force (see chapter 7). So far as possible native enterprises should be set up in the hands of cooperatives, where a large labor force is required, or in the hands of private individuals, where the work of one or two individuals is sufficient.

Linking native income to an agricultural crop, such as copra or fibers, is by no means ideal as a permanent solution. In effect a ceiling is placed upon the value of a day's work and upon the standard of living. Because of the price structure of the world market, where manufactured goods command higher prices than agricultural produce and particularly than tropical produce, this ceiling can be raised only by the introduction of higher paid enterprises involving manufacture. When this takes place it will necessitate reliance upon wage labor as a source of livelihood for Ponapeans, but because this is true it does not follow that wage labor is good in itself or that wage labor on a plantation producing a primary agricultural crop such as copra can pay wages equivalent to those in a factory.

To prevent the reliance upon copra from acting as a ceiling on the standard of living, and to develop a diversified economy that is better able to ride out economic slumps and international crises, every effort should be made to develop other enterprises on Ponape in native hands. As has been indicated, after the reestablishement of the copra industry, the most immediate problem is the restoration of the exports in hibiscus. The restoration of other subsidiary prewar exports such as trepang, ivory nuts, drugs, and coconut-leaf fiber; the development of new exports such as trochus and handicrafts; and the establishment of former Japanese industries in native hands, such as bonito, coir, lumber, coconut oil, and soap production should not be allowed to interfere with the development of copra nad hibiscus, but they should be fully explored. Furthermore, blacksmiths, cobblers, motor mechanics, carpenters, tailors, boat builders, tinsmiths, and any craftsmen engaged in the manufacture or repair of goods for the local market will better enable the economy to survive periods of depression and economic

isolation than will additional exports; in addition, they will stretch the native income by making it possible to spend less for the expensive goods manufactured abroad.

Some of these enterprises will provide new sources of income to natives, and thus reduce the necessity of subsidizing copra prices. It is proposed that this subsidy be maintained only as long as, and only in the amount that is necessary to maintain the standard of living at the prewar level. If, for example, the bonito industry is successfully established in native hands, it may be possible to discontinue subsidization entirely. Reduction of subsidies should of course be done gradually by readjusting the copra price, as new enterprises develop, to a point at which the prewar standard of living is maintained. Once they are no longer necessary additional income through further development can make increases in the standard of living possible.

Others of these enterprises represent sources of income which contributed to the native standard of living before the war. Their reëstablishment will not permit the reduction of subsidies since they are not provided for in the formula of one yen to one dollar for copra prices. This formula, with the subsequent adjustment of wages and prices for local produce and the distribution of Japanese coconut trees to natives, is expected to take care of only (1) the former income from copra, (2) the larger numbers formerly engaged in wage labor, and (3) the larger numbers of foodstuffs and local produce formerly sold to the foreign community for local consumption. To equate the price of copra to the costs of American goods will not restore prewar standards of living if other enterprises are allowed to disappear or if they are underpaid.

Japanese reports do not list separately the native income from fibers, drugs, ivory nuts, turtles and turtle shell, and trepang, and do not include income from wage labor or the sale of food to the local Japanese population. It is impossible to give anything like a reliable estimate of prewar native income, but because such an estimate is essential to immediate planning an attempt has been made, in table 17, to do so for exports in 1940. To the figure of 1,150,708 yen must be added the income from items listed as "unknown," which is assumed to be 100,000 out of 211,398 yen. The income from wage labor in 1940 may be taken as 599,040 yen, calculated on the basis of a daily force of wage laborers from Ponape of 1,200 with a daily cash wage of 1.60 yen (1.20 yen a day plus food). On this basis the total native income in 1940 for the Ponape Branch Bureau can be estimated at about 1,849,745 yen or, in terms of present American prices, $1,850,000. These figures are admittedly tentative, and every effort should be made to obtain as exact a picture of native income, native expenditures, and the prices of Japanese goods as possible. An exact picture could not be obtained on Ponape in the summer of 1946.

Most of the native income in the Ponape Branch Bureau went to the natives on Ponape Island, where the production of hibiscus fibers, usęl ęn thŏng, and ivory nuts was concentrated and where most of the copra was produced. In 1937 Japanese reports show that only 125,223 yen worth of goods were exported to Japan from the ports on Kusiae as against 1,421,386 yen from ports on Ponape. For comparison, native income from exports in 1937 excluding "unknown" items can be estimated tentatively at 752,386 yen, composed of 18,386 yen from ivory nuts, 4,000 yen from trepang, 20,000 yen from hibiscus and coconut-leaf fibers combined, 700,000 yen from copra, and 10,000 yen from usęl ęn thŏng.

It was impossible to test the formula of one yen to one dollar during the period of survey. Supplies of imported goods were totally inadequate and copra production had not yet begun. A survey of the cost of living and income should be made at least annually to make certain that the prewar standard of living is maintained or, conversely, to permit the reduction of the subsidy. The price of copra should be adjusted regularly on the basis of this survey.

As a general policy it is proposed that the entire subsidy be given through copra, which means that other exports must sell at world prices. This policy may hinder the development of some new export commodities, and it may be advisable in certain cases to give part of the subsidy in the form of bonuses or premium prices for new enterprises likely to have real economic benefit for the island as a whole, in much the same way that the Japanese subsidized copra production and Japanese farming.

INTERISLAND ECONOMY

The resources of Ponape can make a limited contribution to the economies of the small atolls, where breadfruit and yams are more difficult to grow, where wood is scarce, and where suitable stones for native ovens are lacking. In return the Ponapeans can accept hats, mats, and other items of handicraft. Interisland trade, however, has never been a significant factor either in the economy of Ponape or of the Bureau as a whole; and before it can assume a more important place in the future, regular and cheap interisland shipping is necessary.

Ponape will undoubtedly continue to serve as the main trading center and source of supply as well as the administrative headquarters for the neighboring islands. The practice of shipping copra and other commodities to Ponape for reëxport should be continued in order that the main shipping services to the outside world may make fewer stops in the islands. This, likewise, will require a reliable system of interisland shipping. The processing of copra from the Bureau into coconut oil and soap on Ponape would not essentially alter this arrangement, and it would make it possible to supply two of the requirements of the Bureau from within the area itself.

With its surplus of land the island of Ponape may offer a solution to the more critical land problems on the smaller atolls. The resettlement of out-islanders from other parts of the Carolines on Ponape in 1912 seems to have worked out satisfactorily from the point of view of both the out-islanders and the Ponapeans themselves. It is impossible to predict how much further this process can be carried without giving rise to social friction or conflict between the different ethnic groups involved. As a matter of principle any proposals for additional immigrations should be approved by the Ponapeans officially. There is no reason at the moment to suppose that the Ponapeans would object to additional out-islanders, since the relations with the present communities are friendly and it is recognized that their skills are complementary. However no attempt should be made to override the wishes of the Ponapeans if they offer any objections. The population of Ponape has been increasing gradually since 1890 (excluding the immigration of out-islanders, over 150 per cent). With adequate medical services the

TABLE 17

Estimate of Native Income from Exports, 1940, Ponape Branch Bureau

Export item	Total exports (yen)	Native (yen)	Unknown (yen)	Japanese (yen)
Plants and animals	100	---	100	---
Cassava	300	---	---	300
Ivory Nuts	94,567	20,000	---	---
Other Cereals, Seeds, etc.		---	74,567	---
Bonito	1,001,163	---	---	1,001,163
Trepang	56,133	25,000	---	31,133
Other Foods, Drinks, etc.	31,483	---	31,483	---
Manufactured, shell, bone, etc.	---	---	---	---
Fats, oil, wax	2,733	---	2,733	---
Alcohol	20,563	---	---	20,563
Other drugs and chemicals		---	---	---
Dye stuffs and paints	---	---	---	---
Coconut leaf	125,708	125,708	---	---
Other ropes, cordage, thread	700,288	500,000[a]	---	200,288[b]
Cloth	10,901	---	---	10,901
Clothing and ornaments	2,530	---	---	2,530
Paper and pulp	---	---	---	---
Mineral and manufactured goods	---	---	---	---
Glass and pottery	18,897	---	---	18,897
Metals and mineral ores	---	---	---	---
Metal goods	65,159	---	---	65,159
Machinery, parts, boats, vehicles	59,696	---	---	59,696
Copra	377,701	300,000	---	77,701
Lumber	282,515	---	102,515	---
Charcoal		---		---
Other Miscellaneous		180,000[c]		---
Total	2,860,437	1,150,708	211,398	1,488,331

[a]Hibiscus bast
[b]Coir
[c]Usęl ęn thōng (see Chapter 11)

land surpluses can be absorbed without additional immigration.

ROLE OF OUTSIDE INTERESTS

The advisability of restricting the role of outside interests in the future economy of Ponape has already been indicated at several points. The alienation of land through lease or sale or the creation of a class of wage laborers dependent upon employment for subsistence can create serious problems. It is doubtful even when outside employers pay higher wages that there is any real long-term gain from the Ponapean point of view, except where outside new techniques of processing are introduced, such as those that transfer laborers from the production of primary raw materials to the manufacture of higher paid finished products. Where this occurs, outside capital and management can make a contribution to the native economy, but even here it would be preferable to develop the enterprise in the hands of native owners, with outside management and technicians hired where necessary. Wherever possible new skills and technical training should be taught to the natives, whose aptitude in this direction is remarkable. As has been indicated there can be no justification for regarding Ponape and its people and resources as constituting, by virtue of conquest, a field to be developed for the benefit of the American businessman, or, conversely, to be neglected for the benefit of the American taxpayer.

Ponape presents a special problem because of the presence of the two Belgian families, who formerly engaged in trade and copra production. It is understood that their plantation was purchased by the Japanese through a forced sale. It is not within the province of this report to suggest a just settlement for these two families, but it should be pointed out that it was not intended that they be included in the recommendation that natives whose land had been acquired by the Japanese under similar circumstances be allowed to return to it without payment. Restrictions regarding the lease and purchase of land should apply to all outside groups, including them, if native rights to land and the native's position as entrepreneur are to be protected. And, aside from questions as to the legality of the Etscheit's claims against the Japanese government or of the American government's obligations, if any, in their case, the policy should be to promote natives, and not Americans or other foreigners, in the fields of trade, copra production, manufacture, etc.

Because of their knowledge of the Ponapean language and, in the case of one of the brothers, of the native attitudes, the Etscheits can and already have been of real service to the administration. The experience of one of the brothers in soap manufacture can similarly make a real contribution to Ponape economy, though as soon as it is feasible this industry should be developed in the hands of native owners. The decision as to their future should rest ultimately with the Ponapeans themselves.

PARALLELS FROM OTHER COLONIAL AREAS

Parallels could be drawn between Ponape and other colonial areas on almost every problem and question of policy that has been discussed: The problem of administering, justly and with sympathy and understanding, a people with a different cultural background, whose attitudes and values are sometimes difficult for the ruling group to understand or appreciate; the problem of guiding a group in the process of social and economic change without being guilty of paternalism, on the one hand, or the total lack of concern for native wishes, on the other; the problem of teaching a foreign language and new ideas without creating only second-rate Americans as an end product or without causing conflict and dissatisfaction in the process; the problem of trying to diversify an economy that in the past has been based primarily on a single crop; the problem of making the choice between possibility of higher income through the introduction of enterprises owned by outside interests and the slower, less certain alternative of educating Ponapeans to perform the same functions for themselves. These and many other problems are met under different circumstances but in basically the same form in almost every empire, whereas the solutions that have been adopted vary considerably both in the principles upon which they have been founded and in their effect on the native populations.

It will be sufficient here to cite only one parallel, drawing upon the works of one of the outstanding critics of colonial policy in Africa, E. D. Morel's "The Black Man's Burden" (p. 167):

> The relative merits of "direct" and of "indirect" rule in the administration of African communities, in the form of representation of African communities and of individual Africans in the mechanism of white government; the processes of education; labour regulations; segregation—these problems and many others, weighty as they severally are, are still of secondary importance, because they do not go to the root of the matter.
>
> The root is the land. Are the peoples of Africa to be regarded and treated as land-owning communities? Or is native tenure in land to be swept away? That is the fundamental issue, because in that issue is involved the destinies of the African peoples, and the whole character of the future relations of Africa with the outer-world. As it is resolved, so will the African peoples develop along the lines of freedom, or along the lines of serfdom. As it is resolved, so will the white peoples be acting as trustees for their black wards, or as exploiters of black labour . . . . Divorce the African communities from the land, and you reduce the units composing them to the level of wage slaves.

The preservation of native rights to the land is the cornerstone upon which administrative policy must be founded. In Ponape it does not present any great difficulties since the Japanese population has been evacuated and there is little likelihood of a large foreign population in the future. It is not the only problem to be solved; laying a solid cornerstone does not guarantee that the other parts of the structure of administration will be well built, or even that they will be completed. But if the cornerstone is shaky, particularly where the land involved is the arable surface of the small islands of Micronesia (as contrasted to the huge continent of Africa, for example), the structure may collapse, however beautifully and carefully finished its other parts may be.

SUMMARY OF RECOMMENDATIONS

The immediate objective is to restore the prewar economy and standard of living. This objective involves several different tasks, all of which can be simply stated, but each of which in turn involves a number of different and sometimes difficult steps.

1) The copra industry must be reëstablished with copra prices set at a level that will make it possible to purchase American goods comparable in quality and quantity to those consumed before the war.

2) Imported goods must be made available on Ponape and in the neighboring islands in quantity and variety adequate to supply the local requirements.

3) Native wages and the prices of native produce must be allowed to adjust to the level of copra prices, so that these sources of income may also be adequate.

4) The questions of land ownership and land tenure should be settled, with first priority being given to the right of natives to establish homesteads on the former Japanese plantations and district lands and the right of natives to resume the practice of making mountain farms in unoccupied land and to grow Cyrtosperma in the freshwater marshes. A complete land survey is necessary to establish and record native titles to their present farmsteads, but in view of the other things to be done this cannot be regarded as having first order of priority.

5) Every effort should be made to reëstablish the export of hibiscus bast so that the subsidies to copra prices will not have to be increased far beyond the point indicated above in order to restore the prewar standard of living.

6) The possibility of reëstablishing former subsidiary exports and of developing new native exports such as handicraft, trochus, lumber, and bonito should be explored, but their investigation and development should not be permitted to interfere with the administration's primary responsibility toward the copra trade and, secondarily, toward hibiscus.

7) Settlement, based on the actual prewar value of the yen, should be made for the surrendered Japanese yen and postal savings for which no payment has been received. Claims against the Japanese government for public and private buildings and for coconut trees and other property destroyed should be pressed.

8) Until recommendation 7 is taken care of, credit must be provided to Oliver Nănipëi for the operation of his copra plantations, and to others for the establishment of new enterprises requiring capital investment.

9) Last, but not least since it is fundamental to several of the objections above, adequate and inexpensive transportation must be provided on Ponape itself,

between the various islands of the Bureau, and between the Eastern Carolines and the markets of the outside world.

Once copra production on a farmstead basis has been reëstablished, it will be possible to devote more attention to the development of crafts, subsidiary exports, and local manufacturing and processing with a view to diversifying the economy and possibly reducing subsidization. It will also be possible to try to provide adequate education, improve sanitation, develop inter-district cooperation and political unity, and to consider the problems of social services, legal regulations concerning native labor and land ownership, and other problems of native welfare. That these are still problems for the future is in itself a commentary on the extent to which Ponape and its neighboring islands were neglected during the first year of occupation.

BIBLIOGRAPHY

American Board of Foreign Missions
- n.d. 1. Puk en Kajanjal eu (children's primer). Boston.
- n.d. 2. Puk en Kak Akan Iran Lamalam (book of Biblical history). Boston.
- n.d. 3. Puk en Kaul (book of hymns). Boston.
- n.d. 4. Puk en Matauatan (book of arithmetic). Boston.
- n.d. 5. Puk en Peutial (book of geography). Boston.
- n.d. 6. Unpublished materials in office at 14 Beacon St., Boston.
- n.d. 7. The Work of God in Micronesia. Boston.

Anonymous
- 1892. Diccionario hispano-kanaka ó sea modesta colección de las voces más usuales y conocidas de esta lengua de la Ascención ó Ponapé é islas immediatas . . . . Tambobong (Philippines).
- 1897. Der Kampf auf den Karolinen. Deutsche Kolonial Zeitung, VIII: 37.
- 1905. Bericht des geschaftsfuhrenden Vizegouverneurs in Ponape über den Orkan vom 20 April 1905. Deutsche Kolonialblatt, XVI: 645-647.
- 1906. Polizeitruppe in Ponape. Deutsche Kolonialblatt, XVII: 286.
- 1909a. Karte der Insel Ponape. Mitteilungen aus den deutschen Schutzgebieten, 22.
- 1909b. Die Lage in Ponape. Deutsche Kolonialblatt, XX: 581-582.

Asten, A.
- n.d. Unter deutscher Flagge: Die Kämpfe auf Ponape. Berlin.

Bascom, William R.
- 1946a. Economic and Human Resources—Ponape, Eastern Carolines. U. S. Commercial Co., Economic Survey of Micronesia, Individual Economic Survey Report.
- 1946b. Ponape: A Pacific Economy in Transition. U. S. Commercial Co., Economic Survey of Micronesia. Honolulu.
- 1946c. U.S.C.C. Survey on Micronesia. Central States Bulletin, 1: 1, 3, 5.
- 1948. Ponapean Prestige Economy. Southwestern Journal of Anthropology, 4: 211-221.
- 1949. Subsistence Farming on Ponape. New Zealand Geographer, 5: 115-129.
- 1950a. Ponape: The Cycle of Empire. Scientific Monthly, 70: 141-150.
- 1950b. Ponape: The Tradition of Retaliation. Far Eastern Quarterly, 10: 56-62.

Bastian, Adolf
- 1901. Ethnologische Zusammengehörigkeiten. Zu Mitteilungen über Sitten und rechtliche Verhältnisse auf Ponape, vom Kaiserl. Vicegouverneur Dr. Hahl. Ethnologisches Notizblatt, 2.

Beasley, H. G.
- 1928. Pacific Island Records: Fish Hooks. London.

Berg
- 1902. Ueber die Insel Ponape. Deutsche Kolonialblatt, 13: 178-179.
- 1903. Von der Ostkarolinen. Deutsche Kolonialblatt, 14: 48-49.

Bliss, Theodora Crosby
- 1906. Micronesia. Fifty Years in the Island World: A History of the Mission of the American Board. Boston.

Brauckmann, R.
- 1939. Kolonialdienst in der Südsee. Brieftagebuch des Kolonial-Sekretära Rudolf Brauckmann . . . . Braunschweig.

Cabeza Pereiro, A.
- 1893. La isla de Ponape. Boletin, Sociedad Geographica de Madrid, 31: 7-68.
- 1895. Estudios sobre Carolinas: La isla de Ponape. Manila.

Capell, A.
- 1954. A Linguistic Survey of the South-Western Pacific. South Pacific Commission, Technical Paper no. 70. Noumea, New Caledonia.

Cheyne, Andrew
- 1852. A Description of Islands in the Western Pacific Ocean, North and South of the Equator . . . . London.

Christian, F. W.
1897. Notes from the Caroline Islands. Ponape. Journal of the Polynesian Society, 6: 187-200.
1898a. On the Outlying Islands. Transactions of the New Zealand Institute for 1897 (vol. 30): 93-109.
1898b. Table of Letter Changes in Dialects of Ponape and Kusaie. Journal of the Polynesian Society, 7: 64-72.
1899a. The Caroline Islands. Travel in the Sea of the Little Lands. London.
1899b. Exploration in the Caroline Islands. Journal of the Royal Geographical Society, 13: 105-136.
1900. Ein Augenblicksbild des Lebens auf Ponape . . . . Deutsche Kolonial Zeitung, 17: 418-420.

Clark
1852. Remarkable Ruins on Ascension. The Friend (Honolulu), n. s. 1: 12.

Clyde, Paul H.
1935. Japan's Pacific Mandate. New York.

Coello de Portugal y Queseda, Francisco D.
1890. Les îles Carolines d'après les anciens documents des archives et des bibliothèques d'Espagne. Bulletin de la Société Académique Indo-Chinoise de France, 3: 336-397.

C[olomb], A.
1880. Quelques mots de la langue de Punyipet . . . . Actes de la Société Philologique, 11: 75-116.

Cons, H.
1886. Les îles Carolines. Bulletin de l'Union géographique du Nord de la France, 6: 465-481.

Coulter, John Wesley
1957. The Pacific Dependencies of the United States. New York.

Cross-Cultural Survey
1943. Meteorology of the Caroline Islands. Institute of Human Relations, Strategic Bulletins of Oceania, 7. New Haven.

Cruesemann, Fr.
1930. Zeugen vorgeschichtlicher Kulturen auf den Südsee-Insein. Erdball, 4: 41-47.

Damon, Samuel C.
1861. Morning Star Papers. Honolulu.

De Castro, D.
1933-34. Sull'estinzione della popolazione indigena della isole Marianne, Caroline, e Palaos. Revista d'Anthropologica, 30: 113-174.

Doane, E. T.
1860. The Ebon and Ponape Dialects Compared. The Friend (Honolulu), n. s. 9: 9-11, 14-15.
1869. Ponape (Letter from the Micronesian Mission). Missionary Herald, 65: 166-169.
1895. A Comparison of the Languages of Ponape and Hawaiian. Journal of the Royal Society of New South Wales, 29: 420-453.

Eilers, Anneliese
1934. Inseln um Ponape. Ergebnisse der Südsee-Expedition 1908-1910, II-B-8.

Farner, D. S.
MS. Compilation on the Diseases of Naval Importance in Micronesia. MS deposited with Bureau of Medicine and Surgery, U. S. Navy Dept., Washington.

Finsch, Otto
1880. Ueber die Bewohner von Ponape. Zeitschrift für Ethnologie, 12: 301-332.
1893. Ethnologische Erfahrungen und Belegstücke aus der Südsee. Annalen des K. K. Naturhistorischen Hofmuseums, 8(2). (Ponape: pp. 231-294).
1914. Südsee-arbeiten. Abtheilungen Hgb. Kolonial Institut, XIV(B9).

Fischer, J. L.
1951. Contemporary Ponapean Land Tenure. Anthropologist's Report,. C A U Ponape, Caroline Islands, 5 June, 1951.
1955. Language and Folktale in Truk and Ponape: A Study in Cultural Integration. unpub. Ph. D. diss., Harvard University.
1956. The Position of Men and Women in Truk and Ponape . . . . Journal of American Folklore, 69(271): 55-62.
1957a. The Eastern Carolines. New Haven.
1957b. Totemism on Truk and Ponape. American Anthropologist, 59: 250-265.
1958a. Contemporary Ponape Island Land Tenure. in: Land Tenure Patterns in the Trust Territory of the Pacific Islands, a Handbook . . . . Guam. Pp. 77-160.
1958b. Folktales, Social Structure, and Environment in Two Polynesian Outliers. Journal of the Polynesian Society, 67(1): 11-36.
1959. Meter in Eastern Carolinian Oral Literature. Journal of American Folklore, 72: 47-52.
1960. Sequence and Structure in Folktales. in: Men and Cultures, Selected Papers of the 5th International Congress of Anthropological and Ethnological Sciences, ed. by A. F. C. Wallace. Pp. 442-446. Philadelphia.
MS. Eastern Carolines Field Notes. Deposited in Peabody Museum Library, Cambridge, Mass.; also a copy in possession of author.

Fischer, J. L., Ann Fischer, and Frank Mahony
1959. Totemism and Allergy. International Journal of Social Psychiatry, 5(1): 33-40.

Fisquet
1845. Bericht des Offiziers der "Danaide." Annales maritimes et coloniales, Jan.

Frazer, James G.
1924. The Belief in Immortality and the Worship of the Gods and Dead. Vol. 3. London.

Friederichsen, L.
1875. Die Ruinen von Nan Matal auf der Insel

Ponape. Geographische Gesellschaft in Hamburg, Jahresbericht 2: 83-96.

Friederichsen, Max
1901. Die Karolinen. Geographische Gesellschaft in Hamburg, Mitteilungen, 17: 1-27.

Fritz, Georg
1912. Ad Majorem Dei Gloriam: Die Vorgeschichte des Aufstandes von 1910-11 in Ponape. Leipzig.
1913. Die Kapuziner in Ponape. Leipzig.

Fujitani, Yoshinaga, and Yoshisohoro Fujitani
1939. Zenkoku shi cho san benran [Handbook of cities, towns, and villages in the Japanese Empire]. Tokyo.

Gartzke, Kapitanleutenant
1911. Der Aufstand in Ponape und seine Niederwerfung durch S. M. Schiffe "Emden," "Nurnberg," "Cormoran," und "Planet." Marine-Rundschau, heft 6.

Garvin, Paul T.
1949. Linguistic Study of Ponape. Final report to CIMA, Pacific Science Board. Washington.
1954. Literacy as a Problem in Language and Culture. Georgetown University Monograph Series in Language and Literature, 7. Washington.
MS 1. A Linguistic Report on Ponape. Deposited with the Pacific Science Board, 1951.
MS 2. Outline of Ponapean Grammar. Deposited with CIMA, 1948.
MS 3. Ponapean, a Micronesian Language.

Garvin, Paul T., and S. H. Riesenberg
1952. Respect Behavior on Ponape: An Ethnolinguistic Study. American Anthropologist, 54: 201-220.

Germany. Reichstag
1902-10. Denkschrift über die Entwicklung der deutschen Schutzgebiete in Afrika und in der Südsee. Berlin.

Girschner, Friedrich
1906. Grammatik der Ponape Sprache. Mitteilungen des Orientalischen Seminars in Berlin. Ostasiatische Studien Abteilungen 1(9): 73-126.
1909. Sagen, Gesänge und Märchen aus Ponape, übersetze aus der Inselsprache. Ed. by E. von Huth. Globus, 95: 235-239.
1910. Zur Sprache von Ponape und der Zentral-Karolinen, Südsee. Anthropos, 5: 560-563.
1911. Die Unruhen auf Ponape. Deutsche Kolonialblatt, 22: 127-132.
1912. Papuanischer Mischkarakter der Sprachen von Ponape und der Zentralkarolinen. Anthropos, 7: 503-504.
1928-29. Die materielle und geistige Kultur der Ponapeer. Mitteilungen aus dem Deutschen Schutzgebieten, 36: 107-111.

Goodenough, Ward
1951. Native Astronomy in Micronesia: A Rudimentary Science. Scientific Monthly, 73: 105-110.
1953. Native Astronomy in the Central Carolines. University of Pennsylvania, University Museum Monographs, no. 10.

Gouts, Auguste
1885. Les îles Carolines, étude générale. Paris.

Grundemann, R.
1899. Die evangelische Mission auf den Karolinen. Deutsche Kolonial Zeitung, 16: 227-228.

Gulick, Addison
1932. Evolutionist and Missionary: John Thomas Gulick. Chicago.

Gulick, Luther Halsey
1853. The Ruins of Ponape. Journal of the American Oriental Society, 3: 495.
1854-57. Letters in The Friend (Honolulu).
1857. Letter in The Missionary Herald, pp. 41-48.
1858a. The Climate and Productions of Ponape or Ascension Island. American Journal of Sciences and Arts, ser. 2, XXVI: 34-49.
1858b. Notes on the Grammar of the Ponape Dialect. Honolulu.
1859a. Micronesia: The Ruins on Ponape. . . . Journal of the American Geographical and Statistical Society, 1: 129-137.
1859b. A Primer of the Ponape Dialect. Ponape.
1860-61. Lectures on Micronesia. in The Polynesian. Reprinted in Annual Report of the Hawaiian Historical Society for 1943 (no. 52): 6-55.
1862. Micronesia. Nautical Magazine and Naval Chronicle, XXI: 169-182, 237-245, 298-308, 358-363, 408-417.
1880. A Vocabulary of the Ponape Dialect. Ponape-English and English-Ponape; with a Grammatical Sketch. Journal of the American Oriental Society, 10: 1-109.

Hahl, Albert
1900. Allgemeiner Bericht über Ponape. Deutsche Kolonialblatt, XI: 544-546.
1901. Mitteilungen über Sitten und rechtliche Verhältnisse auf Ponape. Ethnologisches Notizblatt, 2(2): 1-13.
1902. Feste und Tänze der Eingeborenen von Ponape. Ethnologisches Notizblatt, 3: 95-102.
1904. Ein Beitrag zur Kenntnis der Umgangssprache von Ponape. Mitteilungen des Orientalischen Seminars in Berlin, 7(1): 1-30.

Hale, Horatio
1846. Ethnography and Philology. Vol. VI of: Narrative of the United States Exploring Expedition during the Years 1838, 1839, 1840, 1841, 1842. Philadelphia.

Hambruch, Paul
1911. Die "Sogenannten Ruinen" von Matolenim auf Ponape. Deutsche Gesellschaft für Anthropologie, Korrespondenzblatt, 42: 128-131. Reprinted in Anthropologische Gesellschaft in Wein, Mitteilungen, Sitzungsbericht, 1912: 74-77.
1912. Die Schiffahrt auf der Karolinen- und Marshall-Inseln. Meereskunde, 6. Berlin.

1914. The Ruins of Matolenini or Ponape. Transactions of the Fijian Society for 1912-13.
1926. Die Entstehung von Nan Matol im Staate Matolenim auf Ponape. Die Völkerkunde (Vienna), 2: 79-84.
1932-36. Ponape. Ergebnisse der Südsee-Expedition 1908-1910, II-B-7. Teilband 1: Allgemeiner Teil: Geschichte, Geographie, Sprache Eingeborene. Teilband 2 (with Anneliese Eilers): Gesellschaft und Geistige Kultur. Wirtschaft und Stoffliche Kultur. Teilband 3: Die Ruinen. Ponapegeschichten. Hamburg.

Hernsheim, Franz
1884. Südsee-Erinnerung (1875-1880). Berlin.

Hochstetter, Ferdinand von
1885. Gesammelte Reise-Bericht von der Erdumsegelung der Fregatte "Novara," 1857-59. Vienna.

Hornell, James
1936. The Canoes of Polynesia, Fiji, and Micronesia. B. P. Bishop Museum, special publ. XXVII: 1-454. Honolulu.

Human Relations Area Files
MS. Unpublished materials deposited in files.

Imanishi, N.
1944. Ponape-tō seitaigakuteki kenkyu [study of the ecology of Ponape]. Tokyo.

Izui, Hisanosuke
1942. Ponape-tō seikatsu to gengo [life and language in Ponape]. Pp. 403-437 of Gengogaku ronkō [essays on philology]. Tokyo.

Japan, Imperial Cabinet. Bureau of Publications
1941. Japan-Manchukuo Yearbook Co. Cyclopedia of General Information and Statistics. Tokyo.

Japan. South Seas Government
1921-39. Annual Reports to the League of Nations of the Administration of the South Sea Islands under Japanese Mandate. Tokyo.
1932. Nanyo-cho shisei junen-shi [history of ten years of administration of the South Seas Government]. Tokyo.
1933. Nanyo-gunto yoran [Handbook of South Sea Islands]. Tokyo.
1938. Nanyo-cho tokei nenkan [statistics book]. Tokyo.

Jewett, Frances Gulick
1895. Luther Halsey Gulick, Missionary in Hawaii, Micronesia, Japan, and China. Boston and Chicago.

Keesing, Felix M.
1948. Handbook on the Trust Territory of the Pacific Islands. Washington.
1959. Field Guide to Oceania. National Research Council, Publ. 701, Field Guide no. 1. Washington.

Kirchoff, A.
1899. Umrisse zu einer Landeskunde der Karolinen. Geographische Zeitschrift, 5: 545-562.

Kittlitz, F. H. von
1858. Denkwürdigkeiten einer Reise nach dem russischen Amerika, nach Mikronesien und durch Kamtschatka. Gotha.

Klieneberger, H. R.
1957. Bibliography of Oceanic Languages. London Oriental Bibliographies, no. 1. London.

Kubary, Jan Stanislaw
1873. Die Ruinen von Nanmatal auf der Insel Ponape. Museum Godeffroy, Journal, 1: 123-131.
1875. Weitere Nachrichten von der Insel Ponape. Museum Godeffroy, Journal, 2: 261-267.
1876. Les ruines de Nan matal dans l'île de Ponape. La Nature, 23 Sept. 1876.
1885. Ethnographische Beiträge zur Kenntniss der Karolinen Inselgruppe und Nachbarschaft. Berlin.
1887. Das Tätowiren in Mikronesien speciell auf den Carolinen. In W. Joest, "Tätowiren..." Pp. 74-90. Berlin.
1889-95. Ethnographische Beiträge zur Kenntnis des Karolinen Archipels. Leiden. 3 vols.

Kurze, G.
1888. Spanisches von den Karolinen. Gütersloh.

Lang, Werner
1951. Steinbauten in Mikronesien. Ph.D. thesis at Georg-August-Universität, Göttingen.

Lawrence, Pencile, and John E. deYong
1958. The Use of Names in Ponapean Society. Anthropological Working Papers, 3: 55-79.

Lessa, William A.
1956. Oedipus-type tales in Oceania. Journal of American Folklore, 69(271): 63-73.
1961. Tales from Ulithi Atoll. University of California Folklore Studies no. 13. Berkeley.

Lhotsky, Dr.
1835. Note on Ponape. In The New South Wales Literary, Political, and Commercial Advertiser, Feb., 1835. Reprinted in Ausland, VIII.

Luomala, Katherine
1950. Micronesian Mythology. Pp. 717-722, vol. 2, of Standard Dictionary of Folklore, Mythology, and Legend. New York.

Lütje, Otto
1906. Beitrag zu einer Landeskunde des Karolinen-Archipels.

Mahony, Frank
1960. Taro Cultivation in Ponape. Anthropological Working Papers, 6(2): 99-132.

Mahony, Frank, and Pencile Lawrence
1959. Yam Cultivation in Ponape. Anthropological Working Papers, 4: 1-13.

Makino, Miyoshi
1933. [The Families and System of Succession in Ponape Island]. In [Report on old customs] (in Japanese). Tokyo.

Markham, Sir Clements (trans. and ed.)
1914. The Voyages of Pedro Fernandez de Quiros 1595-1606. Hakluyt Society, Ser. II, vols. 14-15. (Ponape [?] seen, vol. 14, pp. 113-114.)

Matsumura, A.
1918. Contributions to the Ethnography of Micronesia. Journal of the College of Science, Imperial University of Tokyo, 40(7):1-174.

Matsuoka, Shizuo
1935. Mikuroneshia-go no sōgō kenkyū [Comprehensive study of Micronesian languages]. Tokyo.
n.d. Ponape-go no kenkyū. Tokyo.

Maxwell, Capt. W. H.
1882. The Caroline Archipelago. A Note of visit . . . of H.M.S. "Emerald." Proceedings of the Royal Geographical Society, 4: 92-93.

Mueller, F.
1867. Reise der Österreichen Fregatte "Novarra" . . . Linguistischer Thiel. Vienna.

Mueller, K.
1912. Ponape im Sonnenlicht der Oeffentlichkeit. Cologne.

Murdock, George P.
1948. Anthropology in Micronesia. Transactions of the New York Academy of Sciences, ser. II, 11(1). Reprinted as CIMA final report no. 19.

Murphy, Raymond E.
1949. "High" and "Low" Islands in the Eastern Carolines. Geographical Review, XXXIX (3): 425-439. Reprinted as CIMA final report no. 5.

Murrill, R. I.
1948a. Anthropological Study of the Ponape Islanders. CIMA final report.
1948b. Ponape: A Micronesian Culture of the Caroline Islands. Transactions of the New York Academy of Sciences, ser. II, 10: 154-158.
1949. A Blood Pressure Study of Natives of Ponape Island. Human Biology, 21: 47-57.
1950. Vital Statistics of Ponape Island, Eastern Carolines. American Journal of Physical Anthropology, 8: 185-194.

Nautical Magazine
1835-47. Reports of captains passing Ponape in early days (vide Hambruch, Ponape): Evans ("Albion," 1835); White ("Nimrod," 1835); Bruce ("Ymogen," 1838); Blake ("Larne," 1845); "Falcon," 1847.

"Navigator"
1928. In den Ruinen von Metalinim, Ponape. Der Erdball, 2: 411-412.

O'Connell, James F.
1836. A Residence of Eleven Years in New Holland and the Caroline Islands; Being the Adventures of James F. O'Connell, Edited from His Verbal Narration. Boston. translated: Elf Jahre in Australien und auf der Insel Ponape. Erlebnisse eines Irischen Matrosen in den Jahren 1822 bis 1833. Trans. by Paul Hambruch. Berlin, 1929.

Oliver, Douglas
1951a. The Pacific Islands. Cambridge, Mass.
1951b. Planning Micronesia's Future. Cambridge, Mass.
1961. The Pacific Islands. 2nd revised ed. New York.

Ong
1835. Bericht Campbells über die Ruinen von Ponape in 'Hobart Town Courier.' Ausland, 296.

Pacific Islands Yearbook
1932-59. (Passim.) Issued 1932, 1935, 1939, 1942, 1944, 1950, 1956, 1959.

Parkinson, R.
1907. Dreissig Jahre in der Südsee. Stuttgart.

Pauli, C. F. S.
1901. Erlebnisse und Eindrücke des ersten deutschen Ansiedlers in Ponape. Deutsche Kolonial Zeitung, 2: 96-97, 122-125, 149-151.

Pennesi, G.
1885. L'archipelago della Caroline e della Palaos. Societ`a geographica Italiana, Bollettino, 10: 724-742.

Price, Willard
1936. Pacific Adventure. New York. English ed.: Rip Tide in the South Seas. London, 1936. Japanese ed.: The South Sea Adventure: Through Japan's Equatorial Empire. Tokyo, 1936.

Puxley, W. C.
1925. Mysteries of the Pacific. Cornhill Magazine, 58: 603-611.

Quiros, Fernandez de. See Markham, C.; Zaragoza, J.

Ray, S. H.
1892. Note on Chief's Language in Lifu and Ponape. In Newell, J. E., Chief's Language in Samoa. International Orientalists' Congress, 9: 784-801.

Riesenberg, Saul H.
1948. Magic and Medicine in Ponape. Southwestern Journal of Anthropology, 4: 406-429.
1950. The Cultural Position of Ponape in Oceania. Ph.D. thesis, University of California, Berkeley.
1952. Ponapean Omens. Journal of American Folklore, 65: 351-352.
1959. Notes on the Present Regulations and Practices of Harvesting Sea Turtle. . . . Review. American Anthropologist, 61: 1136-1137.
MS. Ponapean Political and Social Organization. Final CIMA report.

Riesenberg, Saul H., and A. H. Gayton
1952. Caroline Island Belt Weaving. Southwestern Journal of Anthropology, 8: 342-375.

Riesenberg, Saul H., and J. L. Fischer
1955. Some Ponapean Proverbs. Journal of American Folklore, 68: 9-18.

Sachet, M-H, and F. R. Fosberg
1956. Island Bibliographies. National Research Council, Pacific Science Board, publ. no. 335. Washington.

Sapper, K., et al.
1920. Ponape. Deutsche Kolonial-Lexicon, III: 83-87. Leipzig.

Sarfert, E.
1911. Zur Kenntnis der Schiffahrtskunde der Karoliner. Korrespondenzblatt der deutschen Gesellschafts für Anthropologie, 42: 131-136.
1912. Ausgrabungsfunde von Nanmatol auf Ponape. Museum für Völkerkunde, Jahrbuch, 5(1911-1912).

Sauvageot, Aurélien
1951. Ponapean, a Micronesian Language, by Paul Garvin. Review. Journal de la Société des Océanistes, 7: 315-317.

Scherzer, Karl
1861-62. Reise der oesterreichischen Fregatte Novarra. . . . Vienna. transl.: Narrative of the Circumnavigation of the Globe by the Austrian Frigate Novarra. . . . London, 1861-63.

Schmeltz, J. D. E.
1897. Johann Stanislaus Kubary, der Erforschen der Südsee-Inseln gest. im October 1896 auf der Karolinen Insel Ponape. Internationales Archiv für Ethnographie, 10: 132-136.

Schmeltz, J. D. E., and Rudolf Krause.
1880. Die ethnographisch-anthropologische Abtheilung des Museum Godeffroy in Hamburg. Hamburg.

Seidel, H.
1911. Die Insel Ponape vor und nach dem Aufstande. Deutsche Kolonial Zeitung, 28: 590-592.

Sharp, Andrew
1960. Discovery of the Pacific Islands. London.

Singer, H.
1899. Die Karolinen. Globus, 76: 37-52.

South Pacific Commission
1956. Social Science Research in the Pacific Islands. Technical Paper no. 98. Noumea.
1957. Index of Social Science Research Theses on the South Pacific. Technical Paper no. 102. Noumea.

Spiegel, E. F.
1912. Kriegsbilder aus Ponape. Berlin.

Spoehr, A.
1952. Anthropology and the Trust Territory: A Study of Recent Researches. Clearinghouse Bulletin of Research in Human Organization, 1(2): 1-3.

Sturges, A. A.
1867. Ponape (Letter from the Micronesian Mission). Missionary Herald, 65: 233-236.

Sturges, A. A., and E. T. Doane
1882. Puk en Jojua. New York.

Sugiura, Kenichi
1940. Ponape-tōmin no keigo [Words of respect in Ponape]. Tokyo, Anthropological Society, Journal, 55: 479-488.

Taylor, C. R. H.
1951. A Pacific Bibliography. Polynesian Society, Memoir 24. Wellington, N.Z.

Thilenius, G., and F. E. Hellwig
1927. Allgemeines Tagebuch der Expedition. Ergebnisse der Südsee-Expedition 1909-1910, I. Hamburg.

Tobin, Jack, et al.
1957. Notes on the Present Regulations and Practices of Harvesting Sea Turtle [sic] and Sea Turtle Eggs in the Trust Territory of the Pacific Islands. Anthropological Working Papers no. 1. Guam.

Toiesha Press
1935. Our Ocean Lifeline. Tokyo.

Trumbull, Robert
1959. Paradise in Trust: A Report on Americans in Micronesia, 1946-1958. New York.

U. S. Commercial Company
1946a. Economic Survey of Micronesia. 16 vols. Honolulu.
1946b. Maps of the Islands of Micronesia. n.p.

United States. Department of State.
1947- Report on Administration of Trust Territories. Annual. Washington.

United States. National Research Council. Pacific Science Board
1947- Annual Reports. Washington.
1953. Films and Bibliography of Publications and Reports Resulting From Field Work. . . . Washington.

United States. Navy Department
1942. Supplemental Sailing Directions, Caroline Island. ONI 31. Washington.
1944a. Administrative Organization and Personnel of Japanese Mandated Islands. Civil Affairs Handbook OPNAV 50E-4. Washington.
1944b. East Caroline Islands. Civil Affairs Handbook OPNAV P22-5. (Orig. 50E-5). Washington.
1944c. The Languages of the Japanese Mandated Islands. Civil Affairs Studies 2. Washington.

1944d. West Caroline Islands. Civil Affairs Handbook OPNAV 50E-7. Washington.

1948a. Handbook of the Trust Territory of the Pacific Islands. see under Keesing, Felix M.

1948b. Trust Territory of the Pacific Islands. Information on the Trust Territory of the Pacific Islands Transmitted by the United States to the Secretary-General of the United Nations Pursuant to Article 88 of the Charter. OPNAV P22-100E. Washington.

Uchinomi, H. (= Utinomi, H.)
1944. Bibliographica Micronesica Scientiae Naturalis et Cultus. Tokyo.

Whiting, A. F.
1956. Nan Madol. Ponape.

Wood, James G.
1868-70. The Natural History of Man; Being an Account of the Manners and Customs of the Uncivilized Races of Man. Vol. 2, pp. 1100-1109. London.

Wood, Junius B.
1921. Yap and Other Pacific Islands under the Japanese Mandate. National Geographic Magazine, 40:591-628.

Yanaihara, Tadao
1935. Nanyo-gunto no kenkyu. Tokyo. Transl. and abridged: Pacific Islands under Japanese Mandate. London and New York.

Zaragoza, Don Justo
1876. Historia del descubrimiento de las regiones Austriales hecho por el General Pedro Fernandez de Quiros. Madrid.

Zuckerkandl, E.
1875. Reise der österreichischen Fregatte "Novara" um die Erde, 1857-59: Anthropologischer Theil . . . Cranien. Vienna.

PLATES

Plate 1. Main entrance to "temple" ruins from canal, Matälanim District

Plate 2. Dancers at l'Ili feast, Kiti District

Plate 3. Nänipön fishing with the large seine, Sokǫ̈s District

Plate 4. Gathering in the large seine, Sokǫ̈s District

Plate 5. Dropping the small seine, Kiti District

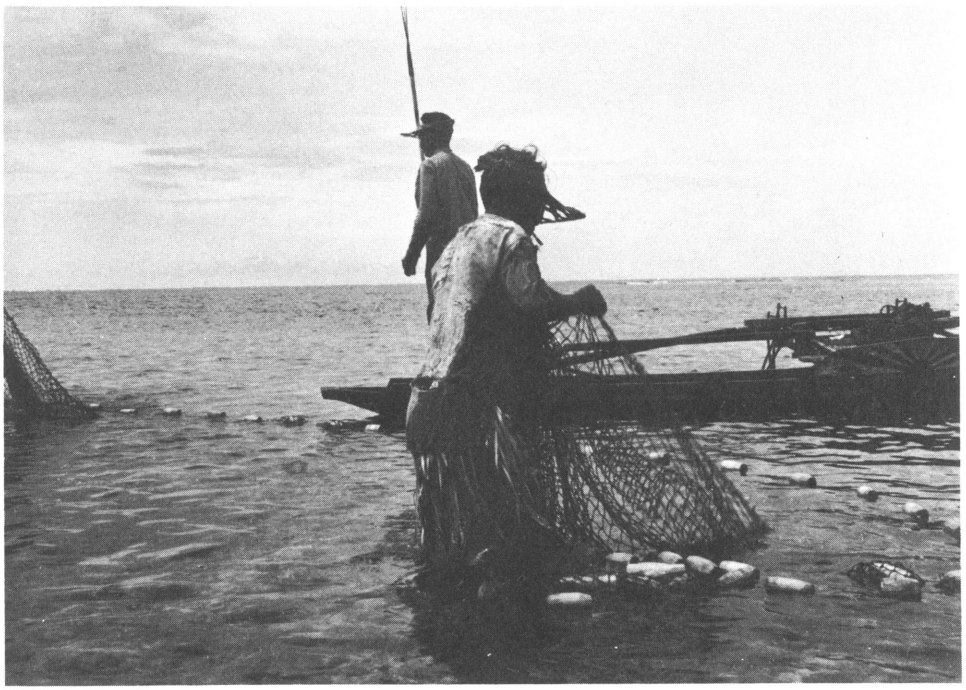

Plate 6. Examining the small seine for fish, Kiti District