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Twenty two years have elapsed before the material collected in Ponape in 1910 is presented to the public. I worked on the island from March 28 to September 21, 1910. The time was not favorable for studies. The revolt that broke out in October, 1910, was being prepared. I had often to struggle with the passive opposition of the aborigines, and apart from that much had really been forgotten. The autochthonous culture had been disintegrated by European and American influences and was in a state of rapid dissolution. A great deal of the material culture had completely disappeared, and with it the technic of its production; in no better condition was the spiritual culture, from which only some fragments could be saved. At times coincidence lent its aid. It was not possible to put together a whole. Yet it could be revealed, almost without a lacuna, how a superior culture, bursting with life, could be utterly destroyed in a few years by foreign influences, not the least by an incorrectly managed, self-seeking mission like the American Board of Commissioners for Foreign Missions in Boston, how amiable natives were transformed into deceitful, sly and selfish natives; how through previous false treatment the life rots of their own culture were destroyed and the new civilization, introduced in unsuited ways, produced unpalatable fruits. The poison of the Boston Mission has too long eaten itself in and taken its effect to be made innocuous by the honest, unselfish work of the Protestant Liebenzeller and the Catholic Capuchin Missions.

The Irish sailor O'CONNELL has preserved in excellent fashion for posterity the set-up of old Ponape. If I had had this book at my disposal already in 1910, in Ponape, perhaps it would have been possible to find out many things that today are irretrievable lost. For in 1910
there still lived some few natives of a great age, e.g. Saulik en Auak, who without any doubt remembered O'Connell. O'Connell indicates that before him the natives had come into contact with whites (pp. 9, 43, 45, 46), and I recently found this confirmed by Louis Becke's book, Wild Life in the Southern Seas; London 1897, pp. 309ff. (Quotation pp. V & VI omitted, deals with white who established himself in position of power in Ponape in 1820 and with the later fortunes of his followers.

Becke is too well informed for this report not to be true, although nothing of it was heard on Ponape or on the other islands. Neither does O'Connell report anything of these whites. Thus the first period of the whites on Ponape seems to have been before 1826.

As I found this book by chance, a systematic search for hidden literature succeeded, during the twenty years in which the monograph was written down, in uncovering many an important report which was already forgotten or not easily accessible. Notes on the Boston missionaries Doane and Sturges, which should be important, disappeared; part seems to be used in "Micronesia" of the woman missionary Bliss. Notes of Barnault of the "Danaide," allegedly in Paris, could not be obtained.

Acknowledgement to various people for help in Ponape and putting material at his disposal. Unfortunately there was a breakdown in the negotiations to publish the manuscript, written in 1922, of the former government physician, Sanitatsrat Max Girschner, who died in Kolberg in 1928. Girschner was the best informed man about the ethical conditions on Ponape. His work as a physician and the help of Kubary's widow (see p. 343) guarantee the excellence of the material whose publication
would make the monograph of Ponape a complete monograph of the island. Everything worth knowing was recorded in the native language, as far as possible, in order to get to some extent irrefrocable material, and also to include, at the same time, documents for the life and thinking of the natives from their own mouth.

General Part

1. History

The first report on the island: After a successful voyage of discovery, the Spanish admiral Alvaro de Mendaña had died in the St. Cruz group on Wednesday, October 18, 1595. His wife followed him in the command, although his second-in-command, the first pilot Pedro Fernandez de Quiros, took over the real leadership. Difficulties with the natives, a great dying among the crew, and the bad state of the ships made it urgent to leave the group. Three ships had remained to him of the four ships of the fleet which had gone to the South Sea: the admiral's ship San Jerónimo, the frigate Santa Catalina and the galiot San Felipe. The fourth, the flag-ship Santa Isabel, had been seen for the last time off Tinakala, north of the St. Cruz group in the night to September 11. It had to be counted lost because of the bad state it was in. Only the San Jerónima was somewhat seaworthy. De Quiros' proposal to take the crew of the two other vessels left to him on his admiral's ship was rejected indignantly. Because every day was valuable, the anchors were weighed in the Graziosa bay on November 18, to start on the homeward voyage. A search for the Santa Isabel, which was, at best, assumed to be near San Cristobal, remained without success. In order to avoid New Guinea, which would only make an undesired stay necessary, de Quiros took his course, NW, which was supposed to lead directly to the Marianas and on to Manila. An indescribably
toilsom hard voyage began. On December 10 the galiot disappeared; she was not heard of again. On December 17 the frigate was lost sight of; the crew had broken down at the pumps. No help could be given to her. The San Jerónimo had to continue on her voyage alone; she kept to the old course. Currents, however, took her far to the east and towards the evening of December 1595 a thus far unknown high island was sighted.

De Quiros reports about it in his diary:

Chapter 22. How They Sighted an Island in the North and of the Great Danger in which the Ship was.

"Natives came from the island in their canoes, some with sails, others without; it was impossible for them to get over the reef, therefore they jumped on it and waved to us with their hands. Towards the afternoon one single native got around the reef and came out with his small canoe. He was on the weather side and far away; therefore it could not be distinguished whether he had a beard, for according to the position we were near the island of the "Barbudos." He appeared to be a well-shaped naked man; he had long, open hair; he pointed to the direction from which he had come and broke something white in his hands, and ate it and lifted coconuts which he drank. He was called, but did not choose to come.

Evening had come and therefore a sailor climbed up to look over the sea and reported some low little islands and many shallow places between which the ship was closed in as if by a fence. One could somewhat lose courage, for whatever course was taken, it seemed (to those who did not understand it) to bring danger. The ship was set to the course and steered on NNW.

This island lies at 6° northern lat. It is nearly round and measures
30 miles in circumference. It is not very high, it has much high forest and cultivated planes. Three miles to the west are four low islands and many others together with them, and all are surrounded by reefs. Farther south the water seems to be clearer.

The ship continued on its course NNW and was between Guam and Saipan on January 3, 1596."

Formerly some held the view that the high island discovered by de Quiros was Truk, which was therefore called Quirosa on the maps. This view is wrong. Rarely is such an exact description of the approach to an island found as here given by de Quiros. It fits only Ponape. He first sighted the regions Kiti and Palan. Palan natives greeted him from afar. From the entrance to Palan the first canoe left for the foreign ship. It fits quite to the real situation when the other natives did not get over the reef between the Kiti harbor and the Palan entrance, which for a considerable distance lies high and dry at low tide. The above mentioned little islands and many shallow places NNW of Ponape are the Pakin islands. The sea is specially filled with reefs and shallows between Ant, Pakin and the main island; this impression is still strengthened by the reef which projects far to NW and the high and low islands at the northern side of Ponape, which become visible after one gets away from the region Palikir. The approach to Truk would have been described quite differently by de Quiros. Even if he had steered to Tol only, he would certainly have seen the other high islands like Fefin, Toloas, Vela, etc., which rise characteristically out of the wide lagoon and from no position appear as a continuous high mountain mass; but de Quiros mentions expressly that the islands nearly round" and 30 miles in circumference." This estimate is, however somewhat too high. Also the approach to Tol, which alone come into question, is not
possible from the sea to such a degree as to give such an exact detailed description of the vegetation as is given by de Quiros; this is possible only in the case of Ponape. Finally the little islands had shallow places west of the island, which he mentions, are not found near Truk but only near Ponape.

The text 198 shows that Europeans, whose description quite fits the Spaniards, landed in Ponape. In Kiti the memory of it has been kept alive until the present day. Even nowadays it is remembered that a foreign ship cast anchor near Nalap, at the entrance to the harbor of Roi-en-Kiti. The natives thought they were gods and made sacrifices of kava to them. But when some of the crew landed, their human nature seems to have become apparent to them. For the solemn reception was followed by a hostile one. The foreigners landed directly at the mouth of the river Kiti behind the bar. The place is still called Sakar en iap, the landing place of the foreigners, where now Nanpei's store is. They were clothed in iron and a man in a black dress with a cross was with them. Because of a misunderstanding a fight broke out in which many Ponape people were killed; the foreigners could not be wounded because of their "hard skins," but finally they could be overcome by spearing their eyes through the visor openings. Spanish silver coins, a cross were later found in Nan Tauas in Matolenim, and a silver circle in Kiti. (cf. later report of Gulick). The things from which information could be gained were carried off; it is not known nowadays where they are. The same is true of the cannon, which was taken ashore before the foreigners disembarked and of which the natives relate:

The Tale of the Arrival of Foreigners in Ponape

A long time ago there appeared a ship before Ponape and cast anchor outside of Nalap. The Ponape people looked at it. They were seized
by fear and said that it was a ship of the spirits; and that the ship came from afar. When the ship fired some shots, there came a chief who administered the tribe of Kiti and had the title Sau en Kiti; he remained in Ore and looked in the direction of the ship, and finally he went to the ship. There they were very friendly with him. And the whole ship's crew was in iron clothes. He took a cannon, put it on his shoulder and jumped over to Nalap with it. He went on to the firm land and went to Tsap ve takai and there put it down. There the cannon remained until the time before smallpox.

Then another ship came to Ponape and went into the passage Pan tei en U. Now one of the foreigners who lived in Kiti, called Kakut, a Frenchman, went to the ship. There he was asked about the cannon. He told them that it was in Kiti. So they went with him to fetch the cannon and take it to the ship. So they took it again away from Ponape.

The ship which fetched the cannon was the English man-of-war HMS Larnie. She visited Kiti in 1839 under her commander, Blake and took the cannon to Hongkong (cf. report of de Rosamel, p. 114ff.). Investigations made for it in 1911 were unsuccessful. To judge by the kava stone on which the cannon was placed in Tsap ve takai, the old seat of the chief in Kiti, in a holy place, it could still be shown to me in 1910, it could have been a small cannoe only, the kind used for mortar shots.

As de Quiros did not land on the island, the supposition may be expressed that the leaking frigate Santa Catalina, of which he had lost sight on December 17, 1595, keeping to the course ordered by de Quiros, had reached Ponape. The landing may have been attempted in order to make the ship seaworthy and supply the crew with provisions with the described end result. Under these circumstances the ship will have left the island again, to perish later. Nobody has ever heard of the frigate again, nor were any findings made on any island, which might give information about her fate.
The Time until the Discovery of the Island

With this Ponape falls into oblivion. The discovery by admiral Lütke must be called the real discovery of the island; not that it did not get known to Europeans or passing ships before that. O'Connell and Gulick (see below), who got acquainted with the island in all its originality and, in part, intactness (1852-1862), make several statements which indicate that European and Chinese vessels sighted the island and also were shipwrecked on it. "Several reports mention sighted ships; for they were thought to be islands which emerged from the sea and disappeared again. Such apparitions were greatly feared, and as long as they were to be seen, the people fled from the beach; and the priests drank kava in order to enlist the mediation of the spirits, until the feared images had disappeared." A picture of a gallion in Matolenim tells of a wrecked Chinese junk; and a chief in Kiti had received a Chinese bowl and a copper teapot from a passing vessel. Whalers cruised in these waters in ever-increasing numbers since the beginning of the 19th century; and it is more than improbably that they did not sight this high island which is visible at a great distance in the daytime. We have however, no reports of it. The proof that the natives came in touch with Europeans is given by the report of the sailor James O'Connell, who was shipwrecked on the island, together with six companions, a short time before Lütke got there. His book "A residence of eleven years in New Holland and the Caroline Islands; being the adventures of James O'Connell, edited from his verbal narrative by B.B. Mussey, Boston, 1836," could not be found in any European library, in spite of a search of many years, until finally in November 1926, the only existing copy came into my hands.
Although natives of the West Carolines had, as can be seen from the letters of P. Cantova (1722), then Chamisso (1819), also Freycinet (1819) and Duperrey (1823), told Europeans of a high island Falupet, Ponape, it had not been found; perhaps it was not seriously sought, because the Truk group with its many high islands were taken for Falupet, the more so as the individual names of the Truk islands were unknown.

The difficulty in good position-finding, as well as the great number of the Caroline islands has made their exact identification difficult, and in part impossible. The island of St. Bartolome which was discovered by Loyasa in 1526 and characterized as a high country west of which low islands lie, more northern than Kusae, cannot be anything else but Ponape. Ponape was probably sighted by Captain Mulgrave in the "Sugar Cane" in 1793, Ponape is also the island seen by J. Ibargoitia in 1801, which however, he just as later the engraver of maps and charts Arrowsmith, took for Quirosa, which was then falsely thought to be Truk, but always described it as a large, moderately high island, a description which fits Ponape only. The high land which M. Dublon in the "St. Antonio" saw in 1814, is perhaps also identical with Ponape.

The discovery of value for discovery of Ponape, the first definite news, the first map of the island is owed to the German-Russian F. Lütke, who sighted Ponape on January 2, 1828. He commanded the corvette "Senjavin," which sailed round the world from 1826-1829 at the order of Tsar Nikolau I. Two detailed reports which supplement each other exist, the one by Lütke himself (Petersburg 1834/36) in Russija and another by Kittlitz, which was not published before 1858.

Both reports follow here. Notes and amplifications explain the names and places necessary for the understanding of the reports.
The Discovery of Ponape

January 14, 1828

Since my entrance into the archipelago of the Carolines it had become my fixed custom to sail with only a few sails at night, so as not to pass or run into an unknown land. Thus I lost 10-11 hours daily, but this certainly considerable loss was made up for by the safety of the navigation, and moreover by much more exact investigation of the traversed part of the sea. Once during the night from January 13-14 I allowed myself not to stick to this resolution. We were at the intersection of the ways of the captains Tompson, Ybaroitaia, Duperrey and some others and it seemed impossible that in this part even the smallest rock should be left for the tiniest island. We calmly followed our course at night with small sails, and at dawn found ourselves in front of a large and high island. We hardly believed our eyes, for such an interesting discovery in this region seemed impossible to us; it gave the proof . . . that the discovery of unknown lands is due to blind chance only. ( )

It is very strange that one of the largest and the highest of all the Caroline Islands was one of the last in the order of discovery. Captain Duperrey sought it 500 miles more to the north, according to the information of the inhabitants of Ouzai who told him of the island of Pouloupa, which was situated WNW from them. ( )

If the wind during the night had blown somewhat stronger or if we had been more north at the end of the day, we would have been in a great danger through this unexpected encounter. Now nothing hindered us to rejoice over this so pleasant discovery, although it is due to chance. Towards 7 o'clock a.m. we were quite near to the coral reef which surrounds the high land all round and at a distance of half a mile, and we heaved to in order to inform ourselves well. Dense stocks of coconut
palms and smoke which rose in various places proved that the island was inhabited. Soon sailing vessels appeared, one after the other coming out from behind the northern point of the land, of which finally forty of varying size surrounded us. The large ones carried fourteen, the small ones, two people. Even from a distance they began to sing, to dance, to gesticulate with head and hands, etc., with all their force. They laid to willingly beside the corvette, but only with great trouble could I persuade one man to come on board, enticing him with the sight of a knife. Their savage features that are full of mistrust, their large, bloodshot eyes, the screaming and the savagery of these island inhabitants made an extremely unpleasant impression on us, for we had not yet forgotten the gentle and reserved behavior of our friends of Kusae (Ualan), from whom they were distinguished in language as well as in appearance.

After we had remained until midday among the savage band, we set sail and bore west along the south coast of the island. Gradually all the canoes left us. Only one native, clinging to the vessel, did not want to leave us, in spite of all our efforts to explain to him that we wanted to get away from his canoe. He tried to steal the sextant. ( )

We followed the indentations of the reef and about three o'clock we noticed an opening that looked like a harbor; to find out I placed Lieutenant Zavalichine in the sloop, accompanied by Dr. Mertens. While we cruised up and down tacking frequently in the corvette, we did not lose sight of them for a moment. Here also we were soon surrounded by a large number of canoes, with the same dances, the same noise and shrieking as before. In one canoe we noticed a woman. It carried several bundles of spears and sacks filled with stones. When they noticed that this
had not escaped out attention and that we were discussing it, they hastened to cover the spears and stones carefully with mats; these precautionary measures showed us that it was not superfluous on our side, to be on our guard.

Lieutenant Zavalichiehe came back without having investigated the lagoon in detail or having measured it, he had been so surrounded by the canoes of the natives who, without doing anything to him, bellowed and screamed at the same time, threw coconuts and various trifles they had prepared into the sloop, inviting our people by gestures to come on land.

By sundown they all left us.

During the night, we cruised up and down, remaining more in the open sea, and in the morning of January 15, we again approached the reef and followed it quite closely. Some people were on the reef and barked like dogs when we sailed past ehm, from which must be concluded that this animal is known to them. Later, this view was confirmed. When we noticed an entrance the sloop was sent out to investigate.

While we heaved to and waited for the sloop, several canoes came to us with which we exchanged coconuts, breadfruits, bananas, fish, a cock and wahl was most peculiar, coconut shells and mussels, which were filled with very good drinking water, which the inhabitants of the island had probably taken not for us, but for themselves. After much hesitation, three chiefs who are here also called iros (uroses), finally agreed to accept our invitation to come on board. For some minutes they were transfixed with surprise and fear, then they picked up a little courage and even made up their minds to enter the cabin, where we gave them several presents and tried to occupy them in every possible manner. They did not have a bit of the amiability of our friends in Kusae.
The figures which were not at all poor-looking made a disagreeable impression because of the restlessness and mistrust with which they were imbued. Their large eyes turned from one side to the other. When an object was given to them as a present, they never wanted to let it go, when we wanted to show them its use. Of course they valued most iron objects made of this metal, especially axes. Several of them tried their strength at the iron faccines, hooks, and winging chains. They certainly wanted to try whether they could get hold of them. The most amiable of all visitors was the iros Lapalap, an old man of about 65, who distinguished himself from the others by his quiet cheerfulness. His leg showed the traces of a serious wound; that makes it probably that interior wars are led among them as on the other high islands of this archipelago. When we set sail to go on, they all went out of the cabin to go to the bridge; for some time they held to the ropes and fortifications; they one after the other jumped into the water and swam to their canoes.

No suitable anchoring place was found in the inlet which had been investigated; the other, opposite the SW point, which Lieutenant Zavalichine had been able to explore in part only the evening before, promised something better; when passing we stopped there and the same officer was ordered to finish his investigation, and he received order to open a flag on the sloop if he was endangered in any way by the inhabitants. All canoes which had appeared followed our sloop into the bay. After some time we saw that the agreed signal was set, we immediately approached the coast more closely and fired some cannon shots. Lieutenant Zavalichine soon returned to the ship and gave me the following account of his investigation:
Geography

[Page 313 of original]

Cartography. [Somewhat more than two pages are devoted to a survey of the various charts that have been made of Ponape. Descriptions of the early surveys have been omitted.]

The surveys made during the time of the German occupation are restricted to corrections and supplements to the chart of Rosamel of 1840. Our admiralty chart number 116 (Title XI, 407, 404) depicts clearly a general survey of the Ponape, the Ant, and Pakin group and in addition, detailed charts of the harbors of Mutok, Lot, and Matalanim, while the Admiralty Chart number 195 contains the detailed charts of the Lanar (Dschokadsch) [H.O. Ponape] and Roi en Kiti (Ronkiti) Harbors. These charts were adopted by the German Navy and published in 1903.

The last chart to be published was one without comments in the "Mitteilungen aus den deutschen Schutzgebieten" (Reports from the German Protectorate) XXII, 1909, called the "chart of the Island Ponape on the basis of the German Admiralty Chart number 116 and with utilization of the surveys of Imperial Vice Governor Berg, October 1902 - January 1906." The chart, compiled by M. Moisel and drawn by G. Thomas, gives a good picture of the cut-up and fissured terrain of the island, also an approximate idea of the rich irrigation [natural] and of the type of colonization. To be sure, this survey also is not at all complete, as only the southeast and the immediate vicinity of the Mesenieng colony are given in detail. The extensive surveys of the terrain by the land surveyor M. Dulk in 1908-1914 were not published. Part of them were buried on an island during the time of the war. A compilation of them in a unified map would show quite a different aspect of Ponape.

Location and Size. Ponape is the largest and highest island of the Carolines. It has a roundish figure, whose periphery in places is marked by deep indentations. Its diameter amounts to between 25 to 30 kilometers; its area has been estimated at about 347 kilometers; its size, therefore, corresponds roughly to the extent of the province of Hamburg. The positions given by former visitors (compare in part, their reports, section on history) need not be repeated here. An approximate determina-

\[Foreign charts could not be inspected.\]
tion of its position can be derived from the exact determination of the observation point on the west side of the island Langard, in the neighborhood of the trading station of the Jaluit Company. This observation point is situated 6°58' 55" N., 158° 17.5' 35" E.

**Structure.** The Senyavin group consists of the principal island Ponape and the two atolls Ant and Pakin, of which the first is situated about 15 kilometers southwest, and the second, approximately 33 kilometers northwest of the principal island.

The principal island is divided into barrier reef and the reef channel containing the outlying islands and the large island.

The barrier reef surrounds Ponape with a girdle several kilometers wide at places and projecting far out, especially in the northwest and northeast. It is set with reef islands, rubble islands, and sand banks, broken through at 20 different places, where sweet water flows off into the sea and interrupts the growth of coral. The barrier reef is narrowest in the south and in the southeast; indeed, the barrier reef and the edge of the principal island almost coincide in Lot. The slope of the reef to the sea is very steep and precipitous at the place where the barrier reef is the widest, whereas it is very gradual in the south and the southeast; at many places a vessel can anchor off the reef in calm weather. Here extend the wonderful, brilliant coral belts with their unique fauna, more beautiful and more impressive than on many similar gardens of the reef channel. On the barrier reef one observes island formations in the most manifold stages of development and disintegration. They are all formed of large and small coral blocks torn out by wind and floods. The pulverized coral sand is washed in between the blocks, gradually cementing the whole into a firm mass. At the same time the flood occasionally builds islands at some places, and gnaws and pulverizes finished islands or the beginnings of islands at other places. Everything is constantly in flux. These islands in particular show the greatest changes when vegetation has not yet taken root. [Sentence with native terms omitted.] The variations in water depth between the tides is not considerable; they are observed to be a marked hindrance to travel only during the spring tides; the increase occasioned by the spring tide amounts to approximately 1.2 - 1.8 meters. The current passing the island is most noticeable at the north tip; it is strongest on the tip of the barrier reef at Nankanpennaram, which projects far to the north, also to the southeast at Nālap en Lot; its manifestations are weaker at the island Nā south of the passage to Mata-
Harbor at Natlap Island at the harbor of Ronkiti, and on the northwest side of the barrier reef in the vicinity of the Palikir Passage. The conflict of the currents is betrayed already at the surface by a 'choppiness more or less strong. At the north side, the current during the ebb sets usually westward, while the flood tide sets eastward.

At the northwest, north, and northeast side from the Tauak Harbor to the Matalanim Harbor, the barrier reef has no islands, only isolated coral blocks emerging only at ebb tide. Brown and white coral sandbanks are situated here on the reef, whose barrier on the seaward side is marked by the white shimmering foam of the surf, the rebound of the powerful NW and NE surf, that strikes the reef here. On the SW, S, and SE side, where the surf is more moderate and the rebound gentler, where the shallower reef slope has already taken a part of the surf's strength, there is visible in addition to individual blocks and many large and small sandbanks, a series of reef islands, some of them rather extensive. They are in part low, elongated block embankments cemented into a whole by sand (pīk), showing here and there beginnings of vegetation, as for example, on the SW side, Pei en Tomara, the Kepara Islands. Other islands are covered with thickets, deciduous trees, and coconut trees; beginning from the west: Tauak, Natlapen Kiti, Zāniak, Nanaur, Laiap, Natik, No, Panian, Natlap, Nanpl, Nanot, Nanior, Nanaur, Nanini, Nakep, Na, and Napali. Only a few are colonized: Panian, Mal, Nanini, Na, and Napali. Others, like Zāniak and Nanaur were formerly used for burial purposes.

This barrier reef is interrupted about twenty times; small, narrow and large, and wide passages lead here into the reef channel or from it out into the open sea. Wherever these inlets have become enlarged and make entrance into the reef channel possible even for rather large European ships, wherever comparatively large quantities of sweet water flow into the reef channel toward the sea, avoiding wider gaps in the reef channel filled with cross, lengthwise, and circular reefs, such gaps have become harbors. The more important passages --- and the harbors into which they lead --- are Ponape Passage (Ponape Harbor), Mant Passage, Aru Passage (Oa Harbor), Napali Passage (Matalanim Harbor), Pōnatik Passage (Lot Harbor), Panian Passage (Mutok Harbor), Natlap Passage (Ronkiti Harbor), Taupen

1 Also called Ponape, Santiago, and Jamestown. At any rate, it is the principal passage.

2 Also called Lee Harbor.
Kepara Passage, Tauenpalang Passage, Tauak Passage, Palikir Passage, Jokaj Passage (Jokaj Harbor). The largest harbor is that of Matalanim; it is visible only infrequently. Once a principal starting harbor for whaling ships, it has long since lost its significance. The situation is the same in the case of other harbors: Lot, Mutok, and Ronkiti. Ponape Harbor alone has significance today; it is the chief harbor of the Carolines. Thus it is well furnished with beacons to mark the reefs and to point out to entering ships a safe course to the anchorages. Nevertheless the passage is not without danger, especially for sailing vessels. Wrecks at the various harbors, high on the reef, are a warning to the seaman.

If the reef channel between the principal island and the barrier reef appears like a rather unified whole, in which the little mountain islands are embedded, this is deceptive. The chart surveys are deceiving. An examination of the detailed surveys of the harbors gives one an idea of the difficulties which this reef channel offers to the navigation not only of small European boats but also of native craft. If one believes that such a channel is everywhere navigable, one is mistaken. The water surface between the principal island and the barrier reef is deceptive; it is in reality a reef, which is honeycombed by a labyrinth of large and small, wide and narrow channels with arms that end for the most part in culs-de-sac. These channels have deep water, while on the reef there are only a few feet of water, making any navigation whatsoever impossible at low tide. The deep water is dark blue, the shallow water is white, pale green, and dark green. The coloring is dark or brilliant, according to the depth of the water and of the bottom, whether it is coral sand, Fucus or seaweed meadow. The region between Tauenpalang, Mutok, and Matalanim Harbor has the most unbroken stretch of interior reef; here on the wide unbroken reef was built one of the shrine of the stone enclosure of Nān Matol*. The channels of the interior reefs are called tau, often with an addition which designates a particular channel, for example Tau en Takokola between Mēshenieng (colony) and Not.

Enclosed by reefs and girt round with dense mangroves, there rises above the interior reef a series of mountainous islands together with several flat rubble islands, which are for the most part covered with mangrove thicket, as for example Takatik in Ponape Harbor. The north side of Ponape has the largest number of these islands.
Mountainous Islands:  

- Jokaj\textsuperscript{1}  
- Japutik\textsuperscript{2}  
- Langar\textsuperscript{3}  
- Param\textsuperscript{4}

- Mantapeitak\textsuperscript{5}  
- Mantapeiti\textsuperscript{6}  
- Tapak\textsuperscript{7}  
- Takaiu\textsuperscript{8}  
- Auatek\textsuperscript{9}

- Tian\textsuperscript{10}  
- Mutokolju\textsuperscript{11}  
- Takai en māsh\textsuperscript{12}  
- Nanue\textsuperscript{13}  
- Mutok i tik\textsuperscript{14}  
- Mutok a lap\textsuperscript{15}

- Likintakei\textsuperscript{16}  
- Mutok\textsuperscript{17}  
- Toletik\textsuperscript{18}  
- Eshil\textsuperscript{19}

\textsuperscript{1} In the NE of the peninsula Matip, Matalanim  
\textsuperscript{2} Interior harbor of Matalanim  
\textsuperscript{3} Outer harbor of Matalanim  
\textsuperscript{4} Extending south of Nanue  
\textsuperscript{5} In front of the SE tip of Nantiati  
\textsuperscript{6} Mutok Harbor  
\textsuperscript{7} Ronkiti Harbor  
\textsuperscript{8} In front of the province Palang

\textsuperscript{10} - colonized
Kepar i tik\(^\circ\) } In front of the province Tomara
Kepar a lap\(^\circ\) } In front of the province Palikir
Mang a pei\(^\circ\) } In front of the province Palikir
Mangapeilono\(^\circ\) } In front of the province Palikir

Rubble Islands:
Takatik } Ponape Harbor
Pashu il\(^\star\) } Extending in the SW of the island Nanue,
Ulitei\(^\star\) } Matainanim
Nan Kiti o pür\(^\star\) } Mutok Harbor
Pei a kēk } West side of the island Jokaj

Certainly the series of islands is not exhausted with this enumeration. A number of important rubble islands appear not to have names; moreover the literally impenetrable mangrove forests of [the districts] Palikir, Palang\(^\*\), Fok, Palikala\(^\*\) conceal many an island that should be designated as independent.

The mountainous islands consist, like the principal island, of basalt; they are cracked and full of fissures, with precipitous, untraversable rocky walls, which are bare at the steep parts, they are covered over and over with rubble, crags, etc., with isolated peaks, often of the oddest form; usually only the narrow strips of sand and occasionally the narrow valleys, where they are not swampy, are capable of being colonized and cultivated. Mountain ridges, with jagged crests that are now sharp and now plateau-like, give each island its particular character. And covering everything is an impenetrable primeval forest, which even after the typhoon of Easter 1905, rendered penetration endlessly difficult, indeed simply impossible. The impossibility of obtaining a panoramic view has prevented the making of chart surveys.

Jokaj is the largest of the mountainous islands surrounding the principal island. In the history of Ponape it has always played a special role, in olden as well as recent and present
times. Since the conquest of this mountainous island by the tribe of the gheu en kauat, proud, conceited, warlike, energetic people, who migrated westward from the Gilbert Islands, it has harassed the principal island. The island's natural situation has in the past and present been a help to the inhabitants in that respect. The terrain makes the island, which is separated from the principal island by a swampy mangrove forest and a narrow channel, almost unassailable; at any rate it is easy to defend. Two parallel mountain ridges, which are separated by a narrow, hilly, and partially swampy high valley, extend across the island from north to south. The western mountain chain is considerably lower than the eastern one, which rises more than 300 meters. It consists of two cone-shaped summits sometimes wooded or sometimes covered with fern and high grass, 100-150 meters in height. [H.O. chart 2930 shows greatest height of 876 feet.] No traversable paths lead from here to the eastern mountain ridge, Tolap. This mountain chain, which from below appears sharp and straight and crowned by a pyramid has at the top a plateau 60 meters wide, which breaks up to Tol en paitong toward the north into individual parts, whose highest remaining parts have the appearance of individual characteristic crags. The series extending northward from the end of the Tolap into the notch of the Hueit nan (transition point from the east to the west side) are the broad Takai usoii, the eroded Repu kapet and the Peipalap Peak. Wide rubble slopes full of caves flank the mountain chain. Peipalap Peak, a mighty basalt block of 200 meters breaking off precipitously to the sea, this bare rock, flattened on the top, forms the distinctive landmark of Ponape. Gullies caused by erosion and 30-40 cm. deep are cut into its exterior side; the rock is crumbly and brittle; sun and rain are at work on it; the rock is continually crumbling away; an enormous rubble heap has formed at its base; cave follows upon cave, formed by the rocky masses which have plunged downward and collided. Swallows and bats make their homes here; their excretions are heaped up here in piles a meter high; most of the caves open toward the seaward side; a deeper penetration is impossible; an unbearable breath-taking stench prevents further investigation, which evidently would be rewarding. Indeed a great many of these caves are burial places, in the largest one of which, Ni mu'lang, those who died at the time of the smallpox plague on Jokaj are buried. Other caves again are open on both sides; they offer access to the winds and become sound channels. ["Gesäusen" in the original German] the natives interpret these peculiar sounds as spirit voices; they avoid these places, go round about them, and do not speak or even whisper; whistling would summon the ani, or spirits. Peipalap once was the site of the house of chief Nanamareki en Jokaj. It was destroyed during a typhoon. Since then the name of Nanamareki has remained un-
represented. The stone foundations are still preserved. In place of the house, however, there towers a mighty wooden cross that is visible far out to sea. From this rock one gets an excellent view across the northern part of the island and over the outer reef and the treacherous inner reefs, which stand out clearly from the deep blue of the sea or of the channels of the interior reef as white or yellow banks or as poisonously green water. A narrow white band interrupted at places by the passes characterizes the outer reef, and far beyond toward Pakin and Kusafa undersea ridges can be seen, which would not be noticeable to a ship on the sea. Sharply and clearly each bay and each coral or mountain island is defined; here already one gets a more definite idea of the structure of the island, usually concealed from the traveler by the dense and so impenetrable forest. Delicate pillars of smoke, shining palms at the edges of the small and the large islands reveal the settlements and plantations, which are contrasted clearly against the undergrowth or the light green mangrove belt, which is now narrow and now broad. On a sunny day the mountain panorama is overpowering. The mountain ridges shift like stage scenery; individual mountains, dark green with copse, yellow-brown where there is fern and heather, range one behind the other; glistening water courses flash up at times between them; the background is formed by the serrated mountain ridges and peaks, often of peculiar shape, and by the crests of the mountains of Palikir, Kiti, Uona', Mata-lanim, U and Not, which obscure the horizon. Violet colors, deep blue in the shadows, shimmer across the rocky walls, over which an infinite number of large and small waterfalls are stretched like a spider web. This view of silhouetted crags and rocks is infinitely charming; the same milieu, the same formations appear in different form and colors, always affording new impressions, but never offering new disclosures. Thus in essentials the description of the landscape of Jokaj will be at the same time sufficient for the remaining mountainous islands and for the principal island. The irrigation is abundant; everywhere water seeps out between the rock fragments; everything is moist; yet only at a few places has the water taken the form of small streams, which received a special name.

Japutik, like Langar and Param, is situated on the other side of Ponape harbor. The small island is leased to the merchant Etschiet for cultivation.

Langar is a high basalt island about 40 meters high, of which one half appears to be broken off or subsided. It has a periphery of approximately 1-1/2 kilometers. On it is the most important trading station of the East Carolines, managed by the Jaluit Company; it is at the same time a coaling station of importance. Two buoys [lit. "mooring barrels"] in the harbor make possible the navigation of large, deep-draft ships. The native settlements, detached farms of a sort, extend along the narrow, verdant edge of the shore; only two little streams, Kapil and Kish in pil e tik, water the little island.

[There follows in the text a list of 12 native settlements and the owners.]

A shallow waterway, Kapas', separates Langar from Param. Param is about four times as large as Langar. It is likewise a mountainous island; the largest part of the island is taken up by a thickly wooded mountain chain, extending northeastward, with two dome-shaped peaks Tol en Param' and Pcn Mali', which are about 100 meters high and between which there is a deep, broad valley. On the northwest side there extends wide, flat land that shrinks to a narrow strip of shore on the southeast side.

[There follows in the text a name list of 12 native settlements, their owners, the 2 peaks, and 6 streams of Param.]

Mant. The Mant Group consists of two rather large basalt islands that are very verdant and characterized by precipitous declivities, the larger one, Mantapeitak and the somewhat smaller one, Mantapeiti. Especially the latter is distinguished by the presence here and there of columnar basalt. Mantapeitak is broken by a chain of hills about 100 meters high, possessing two slight eminences and covered with steep rocks. Both islands are only moderately settled and are subservient to U district. On the barrier reef of the Mant Pass there lies high on the reef as a landmark for seamen, the wreck of the English sailing yacht "Nyanza," which was stranded here in July 1890.

Tapak and the neighboring island of Takaiu are joined together by a wide mangrove thicket, through which a narrow chan-
nel extends. Both are basalt, hilly islands, which are, it is true, sparsely inhabited. [On H. O. chart 425 these two islands are shown as one.]

Auateku and Mutokolj are tiny islets, both colonized. The first is situated at the entrance of the Aru Harbor and is separated from the principal island by a small channel. The other, the trading station on which a natural son of Napoleon III is spending his life, is situated on the transverse reef that separates Oa Harbor from Matalanim Harbor.

Tian is a hilly island emerging from the mangrove thicket separating the peninsula Matip from Mesisa.

Nanue is a large flat island on the south side of Matalanim Harbor rising about 10 to 20 meters above the water and girt round by broad mangrove forests. A narrow reef, on which at ebb tide one can get to the principal island dry of foot, extends between Nanue and the principal island. It is thickly wooded. Adjacent to the southeast side are the structures of Namatol, whose inhabitants were supplied with sweet water from a spring here. Also the stone-tomb of Ponape's conqueror, Ishko Kalaka, is the only stone structure erected on Nanue. On the north side at Skaulong is the Protestant Mission Station and the residence of the chief of Matalanim.

Mutok. Mutok, the Tenedos Island of Lütke, is a mountain island 50 to 60 meters high that closes off Mutok Harbor. A branch of the Pilagata estuary separates it from the mangrove thicket of the province Pok en Kiti. It has two eminences reminiscent of a camel's hump, between which there is embedded a small marshy lake, which has an abundance of water during the rainy season. Opposite Mutok, separated from it by a shallow reef, is situated the low, mangrove-encircled island Nan Kitio Pur, which is uninhabited.

The south and west sides of Ponape are poor in adjacent mountain islands. Those which the Moisel chart of 1909 represents by hatched lines, as for example, Panien, are really coral islands. Likewise Narlap, Roj, Natik, Laciap, and Tauak are coral, not mountain, islands. Toletik is a small low island in the harbor of Ronkiti and is the residence of Nanamariki of Kiti. It is possible that an exact survey of the almost impenetrable mangrove regions of the Pok and Palikaleh provinces will show nuclei of mountain islands. Indeed, broad mangrove thickets on the south and west side of Ponape appear to form protection for the main island, which on the north and east sides is afforded by the adjacent mountain islands. Thus there remain on the west side only the bare basalt islands Eshil, Kepar i
Tik*, and Kepara a Lap all 10 to 20 meters high and the double island Mang a pei*† and Mange pailong*. [Mangapeilong?].

The principal island of Ponape. The impassability of the island, especially after the devastation of the typhoon in 1905, increased the difficulties of making an exact survey, undertaken in 1910 by the surveyor Dulk who had been called to Ponape in 1909.‡ Thus during my sojourn of 5-1/2 months only a casual examination of the arrangement and the structure of the island was possible. The island is criss-crossed by mountain ranges, from which the 3 principal ranges extend, approximately equal in height but in different directions. They have a common origin, the Lake Ni Pitsi, in the southeast part of the island in the province Nān Uona†, situated about 300 meters above sea level and very swampy. It is situated close to the border of the state of Matalänim. From this point there radiate toward SW, NNE, and NW, the 3 most important ranges of the mountains on Ponape. The chain extending SW is short; it is about 6 kilometers long; toward the south it descends gently, toward the north, precipitously; a deeply cut narrow valley, through which the river Kapinipilap†flows, separates it from a chain running NW, extending through Jokaj to Palikir and falling off toward the sea at the jagged Tamatom en sekiir*. The mountain range extending NE forms the boundary of Matalänim near Jokaj and Not; it is very rugged and jagged; twice it plunges from about half the heights of the ridge down to sea level, but in other places maintains a uniform height for long stretches; it has its highest elevations* in U and there descends abruptly and precipitously toward the sea.

The 3 principal mountain ranges have an equal average height of about 400 meters. Also their highest peaks are approximately equal in height; the SW chain has as its highest peak Tolocolme†, the NW range, has as its highest peak the massive rock Nana;*(Nānā Kap, high mountains, new) with Tol o Kol (Monte Santo); the NE range has as its highest peak Kupurisho. Tolocolme is probably somewhat over 600 meters in height, Tol o Kol and Kupuriso about 700 meters. The figure of 872 meters for Tol o Kol is too high; Kupuriso in U overtops it and is approximately 750 meters high. In addition, the chief mountain ranges

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*On the occasion of a feast on Mang a pei the author was given this island as a fief by Lap en palikir and received the title Shaulik en Mang a pei.

†His chart surveys were brought to safety before the Japanese occupation, but are not available.
have another series of characteristic eminences, which have all been named by the natives. From all 3 mountain ranges there extend side ranges, giving a star-like appearance to the chart. They are responsible for the raggedness of the coast with fjord-like indentures extending far into the land. From the Tol o Tom range extends toward the SE the undulating mountain terrain of Lot, from which Shileu (150 meters) (La Guérîte) emerges so conspicuously as a landmark. The Nana range sends out the side ranges of Tahalapux* (205 meters high) and Tamorotong, the range of the Pelikir Mountains with the peaks Tol en Peishi†, Takai†, together with the range Nān pon Mal†, the hilly, heather-covered mountain country, which is continued in the high mountain range of the island of Jokaj. The Kupurisho range has as side ranges: the mountain country of Senipen‡, Letau‡ and Mutup‡, of Meshisho‡ and Not. The islands Takaiu, Tāpak, Mant, Param, and Langar are parts of the secondary ranges, at present partially sunken, of this NE mountain range. A broad valley region opening toward the north extends between the NW and the NE ranges; it is filled with elevations and plains of varied size and height. Of them the pyramid-like Tol en Zireka‡ is the highest and most characteristic eminence.

These mountain ranges are very romantic, they are filled with narrow steep gulches, and often resemble gigantic quarries with boulders heaped in wild confusion. At the base of the steep walls talus is piled up over an area several hundred meters in width. Cave follows upon cave. They are deep, with overhanging ledges, and over them one frequently sees rushing waterfalls. The interior of the caves is filled with the excretions of bats, in piles a meter high, and into which one sinks deeply, and with millions of the exterior portions of insects that have been devoured. A person traversing the island on foot is confronted with indescribable difficulties. The paths, which once led through it, are no longer known to the natives themselves; unused, they were obliterated by the primeval forest and became unrecognizable. The steep paths were also used only with hesitation even in the years when Ponape was more densely populated. With the disappearance of these paths there was extinguished also the natives' sense of locality. In trips into the jungle one must go on one's own; only the compass and characteristic mountain formations give one orientation points. Rocky gulch follows upon rocky gulch, up the mountains and down the mountains. Only very seldom can one use a gigantic fallen tree as a bridge over a gulch and thus shorten one's way. Streams, which in a half to a full hour after it has rained, increase from harmless brooks a few inches deep to torrential streams several meters deep,

* Scaled for the first time in February 1900 by the navy staff physician Dr. Hansen.
hurl rubble, tree trunks, etc. to the valley, and fill up a wide, fertile country. Yet not all of the water unites to form streams; a great deal is held back in the depressions in the terrain, forming together with the earth that was washed down, extensive swamps, which are almost impassable for human beings. The steep mountain walls and peaks are bare; the mountain ridges are covered with a species of Areca palms and dwarfed trees, covered with moss and ferns. They are stony, unfertile; wild doves, chickens, and pigs are abundant in the secluded mountain forests, which alternate with extensive heaths. The high mountains exert a strong attraction on the clouds. Ponape is free of clouds for only a few days in the year; heavy blankets of clouds usually hang over the mountains. As they pass over the island they discharge the masses of water contained in them. It rains abundantly; the island has an annual rainfall of about 6 meters. So it is easy to understand why a rich network of streams should extend over the land and carve in the course of time a maze of large and small valleys into the mountain ranges. The extent of this network is revealed after a fall of rain, when the whole island appears to be covered by a web of waterfalls, which, to be sure, disappear again after a few hours. On the other hand, a number of waterfalls have a continuous flow of water; some, as in U or in the saddle between Tol o Meir and Tol o Kol attain heights of almost 100 meters. The formation of the valley shows that Ponape is a very young land. Nowhere is there a mature valley; everywhere one encounters eroded gullies of varying depth. Not a river or stream reaches the sea without forming drops, waterfalls, and rapids. There is not a stream bed that is free of stones; everywhere there are rock heaps composed of rocks ranging from small ones to some of several hundredweight. At the places where the water courses empty into the reef water are sandbars which are passable only at high tide. Where, as in the west and south of the island, the water courses are short, where the mountains descend to the sea more precipitously, where the waters bring down more earth and deposit it on the shore below, these sandbars form a terrain, in which the mangrove thrives excellently and can grow into great forests. The east coast, which has a gentler incline, has a smaller growth of mangrove. Of the larger watercourses of Ponape: Kapinipilap, Ke Ponu, Pilemuana, PTI en Lot, PTI lap en Letau, Tawenjokolau, PTI en ni pil lap, PTI en tau en nalang, only the fjord-

1Kiti
2Matelanim
3Not
4Palikir
like Tawenjokola and P11 lap en Letau are navigable for comparatively long stretches; all the rest of the numberless streams (all have names however and many have different names for different branches) are navigable neither by boat nor by canoe.

Volcanic forces created the land. When, in the eastern part of the Asiatic mainland, the land sank forming deeply arched depressions, the island world of the Carolines, situated on a common undersea base 2,000 meters deep, was pressed up. Ponape is the highest and the largest of them. Volcanoes, like those on Yap, for example, do not exist on Ponape, and yet the subterranean forces have made themselves felt through earthquakes down to very recent times. The natives still tell of fire which once spurted from the crevices of the earth.

[There follows a native story about such fire.]

Earthquakes were last felt on September 22nd and December 18th of the year 1902 along the course of the southwestern mountain range of Tomorolong, passing over Uona and Anipen toward Rokiti. The earthquake, an underground rumbling with upheavals, was felt most strongly in the region of Lugaileng.

These volcanic movements agree well with geological findings. There were no violent eruptions with ashes or discharge of bombs, etc. What did take place were quiet lava flows, which slowly solidified. Judging from the appearance and structure of the rock this took place in several flows at long intervals. Some of the flows contain enclosures of reef lime. In the south the mountain masses seem to be constituted differently; here, the basalts -- the mountains of Ponape are formed solely of this rock -- may be found more frequently in going through U in columnar jointed structure, while in the north, the amorphous structure predominates. Augite is the chief constituent of these rocks; the columnar basalt contains nepheline-olivine, but is poorer in iron than the more coarsely constituted basalt masses of the north, which contain large quantities of iron (magnetite and titanite) and are rich in quartz, yet poor in nepheline and exhibiting no olivine. Due to the weight of the mountains, these masses in part are of a slate-like structure. The basaltic structure gives to the

1There is no word for earthquake in the Ponape language.
mountains and mountain ridges of Ponape their characteristic forms. The mountain ridges, which at first glance appear like sharp ridges, are in reality rather flat, 50-60 meters, broad, and then sloping down to the sea in steps, with a gradual decrease in slope due to the increased talus hillsides, and finally sinking down into the sea. On inspection the same mountains which from the side appeared like mountain ranges, appear like pyramidal mountains; the most recent mountain formations are low; their characteristic form is that of dome-shaped peaks and chain mountains, as, for example, the mountain country of Palikir.

The rocks are incapable of supporting vegetation. Various factors must first work on them, breaking them up, and thereby prepare the soil. The most important factors are: warmth, rain, bacteria. Basalt is in itself a very hard rock that is not easily covered with vegetation. Bacteria must perform the ground work. A person studying the mountains of Ponape, often comes upon the takai botobot, the white rocks, which at first glance look like limestone. Close up one sees that lichen, algae, and bacteria have united here in a closely knit unit to prepare an initial covering of vegetation. On this substratum grasses, ferns, etc. soon take root and begin to weave a felt-like covering over the stone, a covering which occasionally can be rolled away from the rock like a carpet. These plants hold the water fast, which in turn begins to disintegrate the stone; together with the lichen, algae, etc. which work in the same way, they begin to loosen the soil. The top surface disintegrates, breaks up; water and plants enlarge the cracks present in all rock; the intensive ealefaction by the sun and the considerable cooling off in the night help to make fissures of these cracks; in addition their formation is favored by the structure of the basalt, since columnar basalt splits horizontally or occasionally vertically, and the amorphic rock splits in spherical scales. All this contributes toward hastening the loosening, the crumbling, and the decomposition of the stone and to make easier its transformation into soil. Wherever this process by disintegration takes place high in the mountains on precipitous stone walls, the binding together of the rock is gradually so loosened that great pieces break off, slide away, and plunge downward. These pieces are shattered in landing, so that the factors of disintegration have an easier task with the smaller pieces. After the enrichment of the humus-forming substratum of vegetation, tree flora takes firm root and further disintegrates the rock fragments, for the fine root ends can easily penetrate into the rock fissures and pores. At the same time these interlaced trunks and roots hold the weathered rock that has been washed down by the rain firmly together. One must
also mention the preparatory effect of the wind, the violent squalls and the impact of the wind, which are felt considerably more strongly and forcibly in the mountains and on the mountain walls than on the shore or in the flatter areas of Ponape. The wind, taking the form of squalls, storms, and occasionally typhoons, uproots the trees. In the process, the earth, the soil, and rubble fields are torn up and transformed into impassable fields of debris. Then a great part is washed down from the mountain heights and hills by the ever present rain, and the land and valleys situated below are enriched with these products. Thus the elements are constantly at work leveling the island of Ponape and creating from firm rock a soil made up of more or less fine granules. This soil, which ranges from yellow brown or dark brown to rust brown in color because the rock contains a great deal of iron, varies greatly in quality. At no place is it excellent. It might be fertile in itself, but have its quality radically decreased, like all soil on Ponape, by great quantities of boulders and rubble strata. Furthermore, its fertility depends on the thickness of the layer of soil over the rock base. This boundary is seldom sharp; the transition occurs slowly. Nowhere, however, is its thickness1 considerable; on the average the soil layer on Ponape is 1-1/2 meters thick, not including the soil in the larger river valleys and estuaries. Where to be sure the soil consists of disintegrated rubble, it is greater in depth; here indeed it even forms a finely washed tough clay. There are of course not many places with these clay soils. Plants with deep roots therefore, do not thrive well here, and if one goes into the forest, one also finds no trees with deep roots.

The rich vegetation proves that the nourishing properties of the soils are good, except in the places where great quantities of iron2 are mixed with the soil. Such places are numerous. The many fern-covered heaths, which resemble luxuriant meadows from afar, have their origin in such soil. The iron incrustations create conglomerates, forming iron-rich places and swamp ore which no longer let water and roots through. If such places are depressed, moors and swamps originate, which like our moors keep on forming and growing until they have sizable depths. The best soil is to be found in the estuaries, of which there are unfortunately very few in Ponape. Pure humus

1The thickest soil layer on declivities above the rock = 3 m.
2Magnetic disturbances are observed on the northwest coast between the Tauaf and Palikir Passages.
soil is to be found only in Palang, Uona, and Lot; thus sites for plantations are found in the interior only in exceptional cases. In the main, the plantations, like the settlements, are situated near the shore of the island.

Because of the constitution of the soil, the settlements are confined to the shore area, where the latter is not bordered by broad mangrove forests, and to the valleys of the larger water courses. The more mountainous and stonier the terrain becomes and the less frequently cultivatable soil occurs, the more infrequent are human settlements, especially as there are no complete villages but only individual farms. Thus by and large the interior of Ponape is uninhabited today.

[There follow in the text several pages about various settlements with the names of owners and of the peaks and waterways occurring in each.]

The Colony

At the time of the first contacts of Europeans with the natives, the traffic centers were the harbors of Rokkiti, Lot and Matalām; up to the Spanish period they held first place. The Spaniards however, picked out another place for governing the islands: the peninsula Kesheleng ("face of the east wind"), a piece of land that was obtained from Lap en Not, and on which the Kpomp plantation of the ethnological research worker Jan Kubary lay, next to the American Boston Mission's lot. The Lloi stream forms the boundary between them. For greater personal safety, the government property was fortified; Fort Alfonso XIII was constructed. High walls and batteries together with small batteries enclosed a wide courtyard, in which the residence and administration buildings are located. The fortress was open on the side toward the ocean. Toward the land, a rather broadly extended glacis surrounded the fortress walls, in order to render a secret approach by the natives impossible from the jungle, which reached at the time as far as the walls. After the administration was taken over by the Germans, a large part of the walls and bastions was razed; only a few remnants of the walls testify to their existence. Nothing is left standing of the Spanish government officials' living quarters either. They were demolished in the typhoon of 1905 along with the buildings of the Protestant and Catholic missions situated outside the walls, and had to be completely rebuilt again.
Today the colony appears as follows: If one comes on the steamer entering by the Northwest Pass into the northern harbor and has tied up to one of the two large buoys which lie directly in front of the island Langar, principal seat of the German trading company (Jaluit Gesellschaft), one notices the colony of Ponape to the south hidden under palm foliage in the innermost corner of the bay. The red corrugated iron roofs of the few European houses of white men flash and sparkle toward the observer, and the black, white and red German national flag with the imperial eagle waves proudly on the administration building of the district official. Boats come alongside to transport the visitor to the mainland. A tortuous, frequently curving course marked by beacons and stakes leads through the confusion of coral reefs to the colony. The Spaniards had tried to shorten the distance between the buoys and the landing by a blasted, artificial channel; they stopped short in their attempts and the Germans did not continue them. The landing of the colony is a stone wall stretching out about 50 meters into the water and 6 meters wide, at the head of which a pier 6 meters wide has been added at right angles. The signal installations are located on it. In the pier, near the bank, are buried the two large cannons which once were to keep the natives away from the colony. When one disembarks from the boat, the landing leads to a broad, well-kept coastal road. The boat sheds lie along this road on the water side, and the huge warehouse of the district official and the business houses of the Japanese trading company, Murayawa and Company, which offers competition to the Jaluit Company which cannot be disregarded; both before and after the rebellion of 1910-12 it played a doubtful role; the natives even declaring they had been provided with new guns and fresh ammunition by this firm.

The western end of the coast road stops with the roomy, native hospital "Tivision" with modern furnishings. The name comes down from Spanish times. If one turns here and goes back on the coast road beneath the coconut palms, two paths lead up to a plateau only a few meters higher. Between the two paths, on the street, stand the pretty houses of Girschner the doctor, and the merchant Etscheit; at the doctor's house one becomes acquainted for the first time with the sturdy ivory nut palms, so different from the coconut palms in type, more reminiscent of date palms. On the second path which leads past Etscheit's house up to the plateau, stands, down in the turn opposite this house, the house of Nanpei en Kiti, who lives here, when his business requires his presence in the colony. Huge mango trees shade the house. Going further down the coast road, one comes upon native houses in a few minutes, which might, in an off moment, be taken for European style since they strive to
ima ante the walls with boards and the roof with corrugated iron. A few steps ahead bring us to the site of the former Doane Mission station, today the location of the Liebenzeller Mission, a simple school and church building.

Further on, the coast road turns into a simple native trail, which leads into Kubary's Mpomp plantations. The plateau, horizontal and artificially levelled, was the drill-ground of the Spanish garrison and is used today by the Melanesian police troops. Toward the south, this broad field is bounded by the huge ruins of the walls of the former fort. The breastworks and the gun ramps are still clearly visible today. One of the gates is still moderately well preserved. The rest have been torn down. The old moats have been filled in, the drawbridges have disappeared. On this site, bounding it on the north, stand the office buildings. The district office is located here; here, surrounded by friendly gardens and hedges, stand the attractive quarters, built in bungalow style, of the chief of police, roads overseer and secretary. The area is closed to the east by the buildings of the native police troops and the prison. In the immediate vicinity of the barracks rises a clumsy stone tower, the gun and munitions magazine. Outside the walls, the buildings of the Catholic Capuchin Mission extend off to the Jokaj'side, a row of fine houses, properly constructed and airy. One section is reserved for the padres and assisting brothers, another for the nuns and the school. Down by the water is a fine ship-building and carpentry yard. In 1910 the people were working very hard to shape the stones for building the new cathedral, which was to occupy a site on the western end of the plateau. The number of the faithful had grown much too large to enable all to find room in the small chapel, which was rebuilt after the typhoon of 1905. Besides their pastoral activities, the missionaries devoted all their care to the cultivation of indigenous and European vegetables and fruits, which had already brought them many good results.

Not far away from the mission buildings, in front of the northwest gate of the fort, lies the cemetery. Coconut palms shade it. The number of graves is large, and their appearance strange. Here, in long rows, the Spanish officers and soldiers who lost their lives in battles against the rebellious natives lie at rest. They are unprepossessing burial places, cemented, sarcophagus-like mounds, decorated with beer bottle fragments. Opposite them lie the German officials and soldiers in individual graves, which are neatly decorated with wrought iron or wooden railings and iron, stone, or wooden crosses. Between both burial places rears a tall monument. It is 2-1/2 meters
high, resting on an earth-covered pedestal foundation, from which 5 steps made of basalt slabs rise to support the bronze statue of Jan Stanislaus Kubary, made in Gladenbeck near Berlin and fixed in a block of basalt on top. For 9 years Kubary lived on Ponape, tirelessly pursuing his researches, the records of which have unfortunately been lost.

Extensive coconut groves surround the colony. They have taken the place of the former glacis of the fort. A broad road runs through them inland up onto a small knoll. The seat of government, Peilapalap, a roomy, airily built, white bungalow stands there, with a superb panoramic view of the high mountains of Matalanim, Kiti, Palang, of Jokaj Island with their landmark, the enormous basalt block Pëlipalap, of Ponape Harbor, Langar Island, the fjord-like inlet of Tawenjokola River, and the mountains of Not. Nearby is a roomy, strong building constructed of stone and cement because of visitations by typhoons which would blow the light-weight house off the hill in a few moments. It may be added here that, for dark nights, the colony even possesses street lighting, for which, however, it is forced to rely on oil.

1 Whether his halfcaste wife Anna threw them away or whether she, in her later capacity as governess for the Government physician, Dr. Girschner, communicated a part of her husband's records to him, is not known. Kubary in the last months of his life had pawned part of the records to Nanpei in Kiti for cash. They were mislaid by the latter during the typhoon of 1905 .... The misuse of the name Kubary strikes every ethnologist and every scientist as very deplorable. After a rather loose life with Spanish officers, the widow married a man from Jokaj, who achieved unfortunate fame as "Kubary" in the rebellion and was shot for murder and mutilation of corpses. This man had a native name and it is the height of bad taste that the name of the widow, serving in Girschner's house, was now transferred to her second husband and the latter was designated in the court decrees of the rebellion also as Kubary, instead of by his own name, Keroun en Tol e tik. It would have been Mr. Girschner's duty at the time to enlighten the court, which knew nothing of the name and significance of Kubary, in order not to burden the deceased subsequently with his successor's disgrace.
Missions

[The Boston Mission, after acquiring a rather unsavory reputation, was dissolved in 1907 and replaced by the Evangelical Liebenzeller Mission from Württemberg. The former Spanish Catholic Capuchin Mission, too, is now run by Germans of the same order. The excellently trained missionaries are able to convert the natives to true Christianity.]

Trading Stations

Trade has always been modest and on a small scale. Trading stations were not founded until later on. Previously there flourished a wild barter trade. Ponape shared with many South Sea Islands the fate of being a wintering berth for whalers. They entered the various harbors in large numbers during the time of the northeast trade in the months of November to April, especially Ronkiti, Lot, and Matalanim. New provisions were taken aboard here, breadfruits, yams, taro, bananas, pigs, as well as firewood and water. The natives received in return tobacco, metal articles, firearms, brandy. A coveted item of barter was tortoise shell, of which Ponape had a lavish abundance in those days. Traffic was lively between the female population and the ships' crews, composed of nationals of all countries and all races; they were rogues of the lowest order of human beings, who have left their traces on the Ponape population only too freely, and warped its original gentle character into the opposite. The examples given in the historical section amply elucidate the depredations of the whale fishers in Ponape. Orderly trading conditions did not develop until the seventies, when the Hamburg commercial house of J. C. Godeffroy drew the Carolines into its vastly expanded web of trade. In 1874, the first German trader, A. Capelle, settled here and established the first German trading station. After the collapse of the house of Godeffroy, the house of Hernsheim took over the Godeffroy interests in the Ponape station, which in 1887 passed on to the Jaluit company. This company developed from the German Trade and Plantation Company of the South Sea Islands at Hamburg (Godeffroy) and the firm of Robertson and Hernsheim, both of whom merged their entire interests in the Marshall, Gilbert, and Caroline Islands in the newly founded company.

Copra formed the chief article of export, not only from Ponape, but also the import from the islands surrounding Ponape. In addition, the fruits of the ivory nut palm (vegetable ivory), and some pearl shells and Trochus shells are
exported. Large transactions are not conducted. In the year 1909-1910 only 707 tons of copra were exported from the entire area of the eastern Carolines, the German Jaluit Company and the Japanese Trading Company Murayawa sharing in the exporting.

Among the native traders, a sizable number of whom were active on Ponape, Nanpei en Kiti and Yomatau en Jokaj stood at the top. The last one worked for the merchant Etscheit. The economic possibilities were greater on Ponape. The presence of banana hemp of a very remarkable quality, in land suited for cultivation might have brought results and offered good prospects of competition with Manila hemp. It did not go that far. The attempts at cultivation of cotton, coffee, cocoa, and rubber met with failure; the same results greeted endeavors to replenish the animal stocks. In 1904 four oxen, 37 sheep, 36 goats, and one stud horse were imported. In addition, 3 Saipan deer, 11 pheasants and 21 quail from Hongkong were released in the jungle. In 1909 there was no longer any evidence of these animals; only the ox appeared to adapt itself.

Climate

[Page 345 of original]

Things are in bad condition as far as the basis for judging the climate is concerned. Before 1999, that is to say, before the occupation by the Germans, no meteorological surveys were made. Dr. Gulick had made a beginning, but after his departure, observations were no longer made. During the time of the German occupation the government physician, Girschner, took over the observations. Unfortunately they were not continued uninterruptedly. His observations were rewritten by Dr. P. Heidke and published in "Mitteilungen aus den deutschen Schutzgebieten" (Reports from the German Protectorate). Since the position and correction of the thermometer are unknown, the results cannot be set down as certain. Ponape has a mean temperature of 27.2°. The highest temperature, 27.7°, occurs in March and August, November and December with a temperature of 25.9° are the coolest months. The highest temperature in the observation year 1899/1900 was 33°, the lowest, 20°.

The Carolines, being situated in the western part of the Pacific Ocean, have an abundant rainfall, insofar as they are visited by changing winds, the northwest monsoon, and the southeast trade wind. The heaviest rainfalls have been authenticated for the southern Marshall Islands and the East Carolines. In Jaluit there were in the years 1892-1896 and 1898 an average of 4,386 mm, with 304 days of rain. This mark was exceeded on
The neighboring island of Ponape, which in the year 1902-1903 had a precipitation of 5,024 mm with 259 days of rain. No month is without rain and only very seldom does the monthly rainfall fall below 100 mm. The driest months occur in the time between November and March. As a result of the part that the individual seasons and the occurrence of the rainiest and least rainy times play in the annual rainfall, the average yearly variation in Ponape also is very small and the movement of precipitations very simple. There are, of course, variations, but of such a kind that the occurrence [time] of the maximum and minimum is different for each year. The annual curve changes according to years that have variations in wind conditions. During the strong northeast monsoon, usually from December to April, the rainfall is slight, whereas it is heavy when the winds are weak. The irregular winds from the eastern quadrants and from the southwest bring rain; when the southeast trade wind prevails, the weather is usually dry and beautiful for several weeks at a time.

Ponape is situated in the region of typhoons, those cyclones that occur unexpectedly and then bring unspeakable destruction to countries and islands. Their region of origin is said to be the ocean confined between the Marianas and the Carolines, the region between Guam and Yap. Their aspect varies. Some have been extremely destructive and have left a clear impression in the memory of the natives. During the German occupation such a typhoon occurred on April 20, 1905. Its traces were still to be seen on the island even 5 years later. According to accounts given to me by the natives, this typhoon was of proportions never before observed since white men have been on the island. The acting vice governor Berg tells of it in the "Deutsches Kolonialblatt" [German Colonial News] of 1905, pages 407-409. I take from it the following:

At the outbreak [of the typhoon] Berg was in the western part of Ponape on the island of Kepara and observed there the following barometer readings:

- April 19 about 9 p.m. - a little below 760 mm
- April 20 about 6 a.m. - a little above 755 mm
- April 20 about 11 a.m. - a little above 750 mm
- April 20 about 1:45 p.m. - a little above 730 mm
- April 20 about 2 p.m. - a little above 724 mm
- April 20 about 2:10 p.m. - a little above 720 mm
- April 20 about 2:20 p.m. - a little above 719 mm
Dying down of the typhoon, which appeared to come chiefly from the north, to usual wind strength.

<table>
<thead>
<tr>
<th>Time</th>
<th>Wind Speed</th>
</tr>
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<tbody>
<tr>
<td>2:30</td>
<td>718 mm</td>
</tr>
<tr>
<td>3:00</td>
<td>717 mm</td>
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</tbody>
</table>

Hardly noticeable shift of the wind to the southeast, where a huge dark gray wall of clouds becomes visible, accompanied in the south at 3:30 p.m., 718 mm, at almost highest water level, by a strong reoccurrence of the typhoon -- it struck one in the face like a hail storm, with spray made up of seawater and rain -- of such intensity that I assumed at the beginning that it would drive the surf over the island of Kepar, which is only a few meters high, and its fallen trees.

<table>
<thead>
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<th>Time</th>
<th>Wind Speed</th>
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<tbody>
<tr>
<td>3:45</td>
<td>730 mm</td>
</tr>
<tr>
<td>4</td>
<td>735 mm</td>
</tr>
<tr>
<td>4:15</td>
<td>740 mm</td>
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<tr>
<td>4:30</td>
<td>745 mm</td>
</tr>
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<td>4:45</td>
<td>748 mm</td>
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<tr>
<td>5</td>
<td>749 mm</td>
</tr>
<tr>
<td>5:15</td>
<td>750 mm</td>
</tr>
<tr>
<td>5:30</td>
<td>752 mm</td>
</tr>
</tbody>
</table>

Destruction on the Ant Islands could be observed."

This typhoon in a few hours made of a garden-like island a desolate heap of ruins. Its force is best attested by the stump of a coconut palm that was smoothly cut through by a sheet of corrugated iron approximately 50 cm wide. The sheet of corrugated iron had been torn loose on the island of Langa and hurled through the air. It had travelled several hundred meters in the air and had cut off the palms in the settlement. The head of a native was also cut off by such a sheet. The typhoon claimed 15 human lives. The dead were all natives; no white people were stricken.

On the eastern side of Ponape the islands Na, Nanini, Mal, and others were flooded, and the island of Napali was torn in two. In the harbor the governmental schooner "Ponape" and the schooner of the Jaluit Company, "Diana," were cast up on the reef; the governmental launch "Fliege" sank at Kepar, and took 3 people with it into the depths. The damage to governmental, private, and mission buildings was very great. It was estimated at approximately 500,000 marks.
Since the storm on this Maundy Thursday came from the northeast, the greatest devastation was to be noted on the north and east sides of the island. The south and west suffered less. Tremendous devastation was caused by the typhoon in the woods and crops. The former deep dark green yielded to a yellowish gray coloration. The contours of the mountains everywhere emerged clearly and sharply. The sturdy, giant trees were felled and in falling tore down the vegetation growing on them, thus leaving wide gaps and clearings in the previously continuous jungle. Destruction everywhere; the outlying mangrove forests too, which grow in sticky clay and mud, were torn and mutilated. Among the fruit trees, the breadfruits suffered most. They were blown down and stripped of their fruits; simultaneously the yams, which for the most part are trained on the breadfruit trees, were annihilated. Taro and coconut palms suffered the least; the coconut palm probably because with its flexibility it offered the wind a very meagre surface for attack. The native did not at once find his copra harvest damaged, since the ripe nuts, largely shaken down, could be taken care of right away. The immediate future, nevertheless, looked gloomy. The blossom stems and the young fruits had been destroyed. It was about the same with the bananas. In spite of the fact that the natives are primarily vegetarians, a famine was not to be feared, as the European warehouse of rice lasted for several months. Besides, the sea and rivers yielded a wealth of fish and other animals; on land were pigs, goats, dogs, plus scattered chickens and pigeons, so that there could be no question of a food shortage. The natives for the present had a substitute for their vegetarian diet in the wild yams which are found very abundantly on the island. Taro, arrowroot, sugar cane, and pineapple suffered no damage.

The effect of the typhoon on the animal kingdom is pictured by Berg: "Large gulls, which I have formerly observed occasionally, in Ponape alone, hovered in quantities above Kepera Island after the north typhoon had died down. When the worse southern typhoon was over later, they lay in heaps dead or exhausted in the neighboring mangroves. Many of the wild pigeons perished; those remaining flutter searchingly around the trees, which no longer offer them their fruits, and they approach human dwellings without their usual shyness as if seeking help. The small birds have not yet recovered; one can still catch many of them by hand without difficulty. Dead fish drift on the waves. The flies are more annoying than ever before; robbed of their breeding places, they move in swarms into the few rooms protected from the wind."
After a few weeks the picture was a different one. The island was covered over again with green, even though up in the mountains and on the slopes the fallen giants of trees were visible far away for a long time. It would probably be going too far to conclude, as does the official report, that Ponape has not been through such a typhoon for the last 500 years. The natives tell it differently. It is of interest that the trees on the exposed ridges of the heights withstood the hurricane better than those growing at the foot of the slopes. This is explained perhaps by the fact that the hurricane, meeting resistance at the foot of the mountain and being blocked, developed force all the more devastating. The trees, stripped of their leaves and partly of their branches, indeed even the tree stumps revealed an astounding vitality. Many breadfruit trees, which stretched their limbs toward heaven, maimed and entirely leafless, were in not quite 2 months not only completely green again, but even exhibited fruits as big as walnuts; coconut palms, which had only a few fronds left, unfolded these further and put out new blossom buds - gratifying and significant facts in judging the agricultural value of the Ponape soil.

The Plant Kingdom

The island boasts a luxurious garb of plants. From the shore up to the highest mountain peaks, it is covered all over with green. Dark green of the forest, yellowish green heaths scattered in it, small and large; naked rock comes to light only in a few spots. Its botany is fairly unknown. In 1913 the botanist Ledermann analyzed the flora of Ponape, making many new discoveries. Unfortunately this fairly considerable material collected by him has not yet been published. One must therefore limit oneself to personal observations and the meagre material issued to date.

The individual regions have their characteristic flora. A broad belt of mangroves girdles the island and in parts reaches upward along the rivers far inland. Sonneratia, Barringtonia, Bruguiera, Lumnitzera, form the chief representation, plus the Nipa palms in the swampy lowlands. Sharp, tall grasses, wild sugar cane, reeds, hibiscus, bamboos fringe the banks of rivers and streams and characterize the marshland. On more elevated places, the coconut palm makes its appearance. It is distributed in the lowlands, and particularly, in the coastal area. To some extent it characterizes ancient, abandoned settlements. One or two kilometers inland one may seek it in vain. Whether the forest in the medium elevations is primary or secondary is difficult to decide. The typhoon of 1905 made the
forest become by 1910 such an impenetrable conglomeration, full of mosses, ferns, and vines which spread over the felled giant trees to a great extent, that a hike through them could only be conducted under the most extreme difficulties. Our navy was unable, during the rebellion, to learn this by sorry enough experiences. Which trees make up the high forest here could not be ascertained. The quantity of breadfruit trees, Artocarpus, is remarkable; they sometimes occur in numerous varieties, sometimes form small groves and forests. In addition, there are Calophyllum, Barringtonia, Inocarpus (native chestnuts), Panguin edule, various kinds of Ficus, Terminalia (ti), Garcinia (mango-steen family), Dipterocarpus, Abrus, Erytrina, Premna, Laurus (laurel), and in addition, on the mountain peaks, a palm as yet unidentified, which resembles the betel palm in type, and the ivory-nut palm (Coelococcus caroliniensis). The underbrush is one tangle of hibiscus (Hawaiian, haul); in the higher elevations it is relieved by wild bananas, tree ferns, dwarf trees, etc. Ponape is poor in blossoms and blooms, excepting the red and yellow hibiscus blossoms, the white Calophyllum blossoms, and a few others. The riotous color of our flora is sought in vain on Ponape. The same is true of the occurrence of edible fruits and berries. As stated before, the boundaries between primary and secondary forest have been wiped out; it can no longer be clearly distinguished which part of the virgin forest was cut down by the natives to be used for economic purposes. With the sizable population figure which Ponape once had, large parts of the island must have been made arable which today have grown wild again; sometimes, too, the natives may have roamed in the unfertile heaths. These heaths are characterized by stiff, short grass, and low fern clumps, which grow wretchedly on this red lateritic soil. Isolated hibiscus shrubs and rather frequent Pandanus palms offer a little relief in these barren regions.

As cultivable plants, the native possesses the coconut palm and the breadfruit, plus the banana and the plantain [Plantae]; for field crops he grows yams and sugar cane. Taro and sweet potatoes play a very minor role and are rarely eaten any longer. Moreover, several cultivated plants have been introduced which have reverted to regular weeds, the Spanish pepper (Capsicum minimum), for example, and the papaya (Carica papaya) coming from Brazil; in addition are the pineapple and a few tasty oranges and lemons. Under the Spaniards, the mango tree (Mangifera), ylangylang with enchantingly fragrant yellow blossoms, durian (Durio zibethinus), together with a shrub having lavender colored blooms and greenish fruits which are capable of serving as a kind of substitute soap (Achras sapota).
The atoll islands around Ponape display the typical vegetation of the low coral islands, the larger ones are covered with coconut palms; any beach that could form, possesses the typical shore vegetation of Ipomoea pes caprae (morning glory family), Vigna lutea, Morinda citrifolia, Tournefortia argentea, which the natives like to use for fish poison, Derris and others.

Christian, who possesses a good knowledge of botany and zoology, gives, in his travel book "The Caroline Islands," on pages 328 ff., a detailed list of trees, plants, and shrubs on Ponape which I have reproduced here in extract, with additions: [Some 270 plants are listed, with their scientific and Ponape names, including 43 species of breadfruit, 39 of yams, 23 of bananas, 9 of taro, and 6 of palms.]

The Animal World

We are almost as inadequately informed about the realm of animals as about that of plants. Kubary and Finsch made exhaustive researches in the realm of birds native to Ponape. Kubary collected and described 32 varieties, of which Finsch, during his brief stay collected and observed 30. A good many of them (Kubary, Vögel von Ponape; Journal Museums Godeffroy, No. XII, 1876, 15-40) are native to Ponape alone. To these belong the pigeon species Ptilopus Ponapensis, Phlogoenas Kubarii; the flycatcher Rhipidura Kubarii, the "spectacle bird" (white eye family) Zosterops Ponapensis, a small dwarf parrot Eos rubiginiosa, and the horned marsh owl Otus brachyotus. The rest of the bird species are either cosmopolite birds or native to the Carolines. Their names appear on the tables below [not given here].

In reptile species Ponape is poor. The only ones which have become known are Nabouia cyanura, Lygosoma smaragdina (lizards), and the little, gray gecko Platydactylus lugubus (wall lizard), which is often kept in houses. Finsch also recorded the poverty of the insect world, of which flies and gnats may occasionally grow to be pests. In the line of butterflies, he collected the widely distributed species Danais erippus L., Hypolimnas Bolina, Junonia vellida, and two beautiful kinds of the "ribbon of a society" (Ophideroid specie).


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Only 3 types of mammals appear to be indigenous on Ponape: the rat, the large bat (Pteropus molossinus Tm.), and the dog. O'Connell even reported on the native dogs of Ponape; a detailed description is given by Lütke and von Kittlitz; in the year 1910 there was no longer an example present, only curs could be found with the natives. The house dog by description is akin to the indigenous dog of New Guinea. Whether or not the pig has been bred here is uncertain. O'Connell was not familiar with it. The same holds for the chicken, which likewise appears to have been brought in to the island and then to have gone wild in the jungle; in any case one seldom comes across chickens in the natives' yards. The Ponape people value only the feathers. The meat and eggs are used solely for sale to white men.

Christian, during his stay, likewise made thorough researches in the animal world.

[A section on language is not translated.]

Below are some extracts from the section entitled "The Natives," page 365 ff.]

O'Connell has said that two races have been found on Ponape which differed clearly from each other; an olive-colored race descended from Malayans, and a South Seas black race, perhaps the original inhabitants. He observed very clearly that the light race dominated, the blacks were the common folk and serving class. It is noteworthy that the two races did not intermarry. Such sharp distinctions were no longer apparent in 1909.

Regarding population statistics it may be noted that exact data cannot be given. Actual counts were not made. In the year 1910 the total population was estimated to be about 3,200. How this figure is to be reconciled with the data which the United States noted in its sailing directions and gives as over 7,000 in 1927, is beyond my knowledge. Perhaps Japanese colonists are included here. Certain it is that Ponape at the time of its discovery was thickly settled all over. The settlements today are situated largely in the vicinity of the coast; thus in

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10O'Connell, James, A residence of eleven years in New Holland and the Caroline Islands; being the adventures of James O'Connell edited from his verbal narrative by B. B. Hussey, Boston 1836.
walking across the island one comes upon abandoned sites of dwellings in many places. Only the foundations of the buildings are still recognizable. In 1835 one Dr. Puncherd lived a whole year on Ponape. He estimated the population at that time as about 15,000 natives - which may be correct if a relatively small state like Not could send 1,500 warriors in the campaign against U, as O'Connell describes. Since then in 50 years smallpox, measles, scarlet fever, tuberculosis, etc. were brought in, and a rapid death rate set in which caused the population to shrink in a few months to 1,000 or 2,000 individuals. Since then it has only been able to recover slowly. That is also one of the reasons why the old types are declining so rapidly among the illegitimates. It may be further added that these illegitimate persons possessed better resistance against European diseases.

The Ponape native is in general of medium height, stocky and with powerful muscles; obesity is rare. Women are small, slender, very delicately formed, and the girls, when young, are attractive and pretty; they age quickly however. There can be no discussion actually of a typical profile, although the pure blooded Ponape man could be picked out at once in the population of the Carolines as a whole. The long narrow face and the high forehead remain noticeable; the profile of the women matches on the average the women of the Central Carolines. The skin color is of all shadings between yellow and dark brown.

Ponape is not limited in its diseases. Indigenous ones are ringworm, and a skin disease forming small blisters, in addition to leprosy, framboesia, elephantiasis, dysentery, colds, ektropium; moreover the natives have suffered since ancient times from hookworm, which takes a heavy toll among the population. Rheumatism and bronchitis are likewise indigenous. Introduced diseases were smallpox, measles, sexual diseases, tuberculosis, and grippe; the latter regularly claims a series of victims after every visit by a ship, for example the pilot steamer or a warship.
Twenty two years have elapsed before the material collected in Ponape in 1910 is presented to the public. I worked on the island from March 28 to September 21, 1910. The time was not favorable for studies. The revolt that broke out in October, 1910, was being prepared. I had often to struggle with the passive opposition of the aborigines, and apart from that much had really been forgotten. The autochthonous culture had been disintegrated by European and American influences and was in a state of rapid dissolution. A great deal of the material culture had completely disappeared, and with it the technic of its production; in no better condition was the spiritual culture, from which only some fragments could be saved. At times coincidence lent its aid. It was not possible to put together a whole. Yet it could be revealed, almost without a lacuna, how a superior culture, bursting with life, could be utterly destroyed in a few years by foreign influences, not the least by an incorrectly managed, self-seeking mission like the American Board of Commissioners for Foreign Missions in Boston, how amiable natives were transformed into deceitful, sly and selfish natives; how through previous false treatment the life rots of their own culture were destroyed and the new civilisation, introduced in unsuited ways, produced unpalatable fruits. The poison of the Boston Mission has too long eaten itself in and taken its effect to be made innocuous by the honest, unselfish work of the Protestant Liebenzeller and the Catholic Capuchin Missions.

The Irish sailor O'CONNELL has preserved in excellent fashion for posterity the set-up of old Ponape. If I had had this book at my disposal already in 1910 in Ponape, perhaps it would have been possible to find out many things that today are irretrievably lost. For in 1910
there still lived some few natives of a great age, e.g. Saulik en Auak, who without any doubt remembered O'Connell. O'Connell indicates that before him the natives had come into contact with whites (pp. 9, 43, 45, 46), and I recently found this confirmed by Louis Becke's book, Wild Life in the Southern Seas; London 1897, pp. 309ff. (Quotation pp. V & VI omitted, deals with white who established himself in position of power in Ponape in 1820 and with the later fortunes of his followers.

Becke is too well informed for this report not to be true, although nothing of it was heard on Ponape or on the other island. Neither does O'Connell report anything of these whites. Thus the first period of the whites on Ponape seems to have been before 1826.

As I found this book by chance, a systematic search for hidden literature succeeded, during the twenty years in which the monograph was written down, in uncovering many an important report which was already forgotten or not easily accessible. Notes on the Boston missionaries Doane and Sturges, which should be important, disappeared; part seems to be used in "Micronesia" of the woman missionary Bliss. Notes of Barnault of the "Danaide," allegedly in Paris, could not be obtained.

Acknowledgement to various people for help in Ponape and putting material at his disposal. Unfortunately there was a breakdown in the negotiations to publish the manuscript, written in 1922, of the former government physician, Sanitatsrat Max Girschner, who died in Kolberg in 1928. Girschner was the best informed man about the ethical conditions on Ponape. His work as a physician and the help of Kubary's widow (see p. 343) guarantee the excellence of the material whose publication
would make the monograph of Ponape a complete monograph of the island. Everything worth knowing was recorded in the native language, as far as possible, in order to get to some extent irrefrocable material, and also to include, at the same time, documents for the life and thinking of the natives from their own mouth.

General Part

1. History

The first report on the island: After a successful voyage of discovery the Spanish admiral Alvaro de Mendana had died in the St. Cruz group on Wednesday, October 18, 1595. His wife followed him in the command, although his second in command, the first pilot Pedro Fernandez de Quiros, took over the real leadership. Difficulties with the natives, a great dying among the crew, and the bad state of the ships made it urgent to leave the group. Three ships had remained to him of the four ships of the fleet which had gone to the South Sea: the admiral's ship San Jeronimo, the frigate Santa Catalina and the galiot San Felipe. The fourth, the flag-ship Santa Isabel, had been seen for the last time off Tinakala, north of the St. Cruz group in the night to September 11. It had to be counted lost because of the bad state it was in. Only the San Jeronima was somewhat seaworthy. De Quiros' proposal to take the crew of the two other vessels left to him on his admiral's ship was rejected indignantly. Because every day was valuable, the anchors were weighed in the Graziosa bay on November 18, to start on the homeward voyage. A search for the Santa Isabel, which was, at best, assumed to be near San Cristobal, remained without success. In order to avoid New Guinea, which would only make an undesired stay necessary, de Quiros took his course, NW, which was supposed to lead directly to the Marianan and on to Manila. An indescribably
toilsom hard voyage began. On December 10 the galiot disappeared; she was not heard of again. On December 17 the frigate was lost sight of; the crew had broken down at the pumps. No help could be given to her. The San Jeronimo had to continue on her voyage alone; she kept to the old course. Currents, however, took her far to the east and towards the evening of December 1595 a thus far unknown high island was sighted.

De Quiros reports about it in his diary.

Chapter 22. How They Sighted an Island in the North and of the Great Danger in which the Ship was.

"Natives came from the island in their canoes, some with sails, others without; it was impossible for them to get over the reef, therefore they jumped on it and waved to us with their hands. Towards the afternoon one single native got round the reef and came out with his small canoe. He was on the weather side and far away; therefore it could not be distinguished whether he had a beard, for according to the position we were near the island of the "Barbudos." He appeared to be a well-shaped naked man; he had long, open hair; he pointed to the direction from which he had come and broke something white in his hands, and ate it and lifted coconuts which he drank. He was called, but did not choose to come,

Evening had come and therefore a sailor climbed up to look over the sea and reported some low little islands and many shallow places between which the ship was closed in as if by a fence. One could somewhat lose courage, for whatever course was taken, it seemed (to those who did not understand it) to bring danger. The ship was set to the course and steered on NNW.

This island lies at 6 northern lat. It is nearly round and measures
30 miles in circumference. It is not very high, it has much high forest and cultivated planes. Three miles to the west are four low islands and many others together with them, and all are surrounded by reefs. Farther south the water seems to be clearer.

The ship continued on its course NNW and was between Guan and Saipan on January 3, 1596."

Formerly some held the view that the high island discovered by de Quiros was Truk, which was therefore called Quirosa on the maps. This view is wrong. Rarely is such an exact description of the approach to an island found as here given by de Quiros. It fits only Ponape. He first sighted the regions Kiti and Palan. Palan natives greeted him from afar. From the entrance to Palan the first canoe left for the foreign ship. It fits quite to the real situation when the other natives did not get over the reef between the Kiti harbor and the Palan entrance, which for a considerable distance lies high and dry at low tide. The above mentioned little islands and many shallow places NNW of Ponape are the Pakin islands. The sea is specially filled with reefs and shallows between Ant, Pakin and the main island; this impression is still strengthened by the reef which projects far to NW and the high and low islands at the northern side of Ponape, which become visible after one gets away from the region Palikir. The approach to Truk would have been described quite differently by de Quiros. Even if he had steered to Tol only, he would certainly have seen the other high islands like Fefin, Toloas, Vela, etc., which rise characteristically out of the wide lagoon and from no position appear as a continuous high mountain mass; but de Quiros mentions expressly that the island is nearly round" and 30 miles in circumference." This estimate is, however somewhat too high. Also the approach to Tol, which alone come into question, is not
possible from the sea to such a degree as to give such an exact detailed description of the vegetation as is given by de Quiros; this is possible only in the case of Ponape. Finally the little islands nad shallow places west of the island, which he meintions, are not found near Truk but only near Ponape.

The text 198, shows that Europeans, whose description quite fits the Spaniards, landed in Ponape. In Kiti the memory of it has been kept alive until the present day. Even nowdays it is remembered that a foreign ship cast anchor near Nalap, at the entrance to the harbor of Roi-en-Kiti. The natives thought they were gods and made sacrifices of kava to them. But when some of the crew landed, their human nature seems to have become apparent to them. For the solemn reception was followed by a hostile one. The foreigners landed directly at the mouth of the river Kiti behind the bar. The place is still called Sakar en iap, the landing place of the foreigners, where now Nanpei's store is. They were clothed in iron and a man in a black dress with a cross was with them. Because of a misunderstanding a fight broke out in which many Ponape people were killed; the foreigners could not be wounded because of their "hard skins," but finally they could be overcome by spearing their eyes through the visor openings. Spanish silver coins, a cross were later found in Nan Tauas in Matalenim, and a silver circle in Kiti. (cf. later report of Gulick). The things from which information could be gained were carried off; it is not known nowadays where they are. The same is true of the cannon, which was taken ashore before the foreigners disembarked and of which the natives relate:

The Tale of the Arrival of Foreigners in Ponape

A long time ago there appeared a ship before Ponape and cast anchor outside of Nalap. The Ponape people looked at it. They were seized
by fear and said that it was a ship of the spirits; and that the ship came from afar. When the ship fired some shots, there came a chief who administered the tribe of Kiti and had the title Sau en Kiti; he remained in Ore and looked in the direction of the ship, and finally he went to the ship. There they were very friendly with him. And the whole ship's crew was in iron clothes. He took a cannon, put it on his shoulder and jumped over to Nalap with it. He went on to the firm land and went to Tsap ue takai and there put it down. There the cannon remained until the time before smallpox.

Then another ship came to Ponape and went into the passage Pan tei en U. Now one of the foreigners who lived in Kiti, called Kakut, a Frenchman, went to the ship. There he was asked about the cannon. He told them that it was in Kiti. So they went with him to fetch the cannon and take it to the ship. So they took it again away from Ponape.

The ship which fetched the cannon was the English man-of-war HMS Larne. She visited Kiti in 1839 under her commander Blake and took the cannon to Hongkong (cf. report of de Rosamel p. 114ff.). Investigations made for it in 1911 were unsuccessful. To judge by the kava stone on which the cannon was placed in Tsap ue takai, the old seat of the chief in Kiti, in a holy place, it could still be shown to me in 1910, it could have been a samll cannon only, the kind used for mortar shots.

As de Quiros did not land on the island, the supposition may be expressed that the leaking frigate Santa Catalina, of which he had lost sight on December 17, 1595, keeping to the course ordered by de Quiros, had reached Ponape. The landing may have been attempted in order to make the ship seaworthy and supply the crew with provision with the described end result. Under these circumstances the ship will have left the island again, to perish later. Nobody has ever heard of the frigate again, nor were any findings made on any island, which might give information about her fate.
The Time until the Discovery of the Island

With this Ponape falls into oblivion. The discovery by admiral Lutke must be called the real discovery of the island. Not that it did not get known to Europeans or passing ships before that. O'Connell and Gulick (see below), who got acquainted with the island in all its originality and, in part, intactness (1852-1862), make several statements which indicate that European and Chinese vessels sighted the island and also were shipwrecked on it. "Several reports mention sighted ships; for they were thought to be islands which emerged from the sea and disappeared again. Such apparitions were greatly feared, and as long as they were to be seen the people fled from the beach; and the priests drank kava in order to enlist the mediation of the spirits, until the feared images had disappeared. A picture of a gallion in Matolenim tells of a wrecked Chinese junk; and a chief in Kiti had received a Chinese bowl and a copper teapot from a passing vessel. Whalers cruised in these waters in ever increasing numbers since the beginning of the 19th century; and it is more than improbably that they did not sight this high island which is visible at a great distance in the daytime. We have however, no reports of it. The proof that the natives came in touch with Europeans is given by the report of the sailor James O'Connell, who was shipwrecked on the island, together with six companions, a short time before Lutke got there. His book "A residence of eleven years in New Holland and the Caroline Islands; being the adventures of James O'Connell, edited from his verbal narrative by BB Mussey, Boston, 1836, could not be found in any European library, in spite of a search of many years, until finally in November 1926, the only existing copy came into my hands."
Although natives of the West Carolines had, as can be seen from the letters of P. Cantova (1722), then Chamisso (1819), also Freycinet (1819) and Duperrey (1823), told Europeans of a high island Falupet, Ponape, it had not been found; perhaps it was not seriously sought, because the Truk group with its many high islands were taken for Falupet, the more so as the individual names of the Truk islands were unknown. The difficulty in good position-finding, as well as the great number of the Caroline islands has made their exact identification difficult, and in part impossible. The island of St. Bartolome which was discovered by Loyasa in 1526 and characterized as a high country west of which low islands lie, more northern than Kusae, cannot be anything else but Ponape. Ponape was probably sighted by Captain Mulgrave in the "Sugar Cane" in 1793, Ponape is also the island seen by J. Ibargoitia in 1801, which however, he just as later the engraver of maps and charts Arrowsmith, took for Quirosa, which was then falsely thought to be Truk, but always described it as a large moderately high island, a description which fits Ponape only. The high land which M. Dublon in the "St. Antonio" saw in 1814, is perhaps also identical with Ponape.

The discovery of value for discovery of Ponape, the first definite news, the first map of the island is owed to the German Russian F. Lutke who sighted Ponape on January 2, 1828. He commanded the corvette "Senjawin," which sailed round the world from 1826-1829 at the order of Tsar Nikolau I. Two detailed reports which supplement each other exist, the one by Lukke himself (Petersburg 1824/36) in Russia and another by Kittlitz, which was not published before 1858.

Both reports follow here. Notes and amplifications explain the names and places necessary for the understanding of the reports.
The Discovery of Ponape

January 14, 1828

Since my entrance into the archipelago of the Carolines it had become my fixed custom to sail with only a few sails at night, so as not to pass or run into an unknown land. Thus I lost 10-11 hours daily, but this certainly considerable loss was made up for by the safety of the navigation, and moreover by much more exact investigation of the traversed part of the esa. Once during the night from January 13-14 I allowed myself not to stick to this resolution. We were at the intersection of the ways of the captains Tompson, Ybargoitia, Duperrey and some others and it seemed impossible that in this part even the smallest rom should be left for the tiniest island. We calmly followed our course at night with small sails, and at dawn found ourselves in front of a large and high island. We hardly believed our eyes, for such an interesting discovery in this region seemed impossible to us; it gave the proof . . . that the discovery of unknown lands is due to blind chance only.

It is very strange that one of the largest and the highest of all the Caroline Islands was one of the last in the order of discovery. Captain Duperrey sought it 500 miles more to the north, according to the information of the inhabitants of Ouzai who told him of the island of Pouloupa, which was situated WNW from them.

If the wind during the night had blown somewhat stronger or if we had been more north at the end of the day, we would have been in a great danger through this unexpected encounter. Now nothing hindered us to rejoice over this so pleasant discovery, although it is due to chance. Towards 7 o'clock a.m. we were quite near to the coral reef which surrounds the high land all round and at a distance of half a mile, and we heaved to in order to inform ourselves well. Dense stocks of coconut
palms and smoke which rose in various places proved that the island was inhabited. Soon sailing vessels appeared, one after the other coming out from behind the northern point of the land, of which finally forty of varying size surrounded us. The large ones carried fourteen, the small ones two people. Even from a distance they began to sing, to dance, to gesticulate with head and hands, etc., with all their force. They laid to willingly beside the corvette, but only with great trouble could I persuade one man to come on board, enticing him with the sight of a knife. Their savage features that are full of mistrust, their large, bloodshot eyes, the screaming and the savagery of these island inhabitants made an extremely unpleasant impression on us, for we had not yet forgotten the gentle and reserved behavior of our friends of Kusae (Ualan), from whom they were distinguished in language as well as in appearance. After we had remained until midday among the savage band, we set sail and bore west along the south coast of the island. Gradually all the canoes left us. Only one native, clinging to the vessel, did not want to leave us, in spite of all our efforts to explain to him that we wanted to get away from his canoe. He tried to set al the sextant.

We followed the indentations of the reef and about three o'clock we noticed an opening that looked like a harbor; to find out I placed Lieutenant Zavalichine in the sloop, accompanied by Dr. Mertens. While we cruised up and down tacking frequently in the corvette, we did not lose sight of them for a moment. Here also we were soon surrounded by a large number of canoes, with the same dances, the same noise and shrieking as before. In one canoe we noticed a woman. It carried several bundles of spears and sacks filled with stones. When they noticed that this
had not escaped out attention and that we were discussing it, they hastened to cover the spears and stones carefully with mats; these precautionary measures showed us that it was not superfluous on our side, to be on our guard.

Lieutenant Zavalichihe came back without having investigated the lagoon in detail or having measured it, he had been so surrounded by the canoes or the natives who, without doing anything to him, bellowed and screamed at the same time, threw coconuts and various trifles they had prepared into the sloop, inviting our people by gestures to come on board.

By sundown they all left us.

During the night, we cruised up and down, remaining more in the open sea, and in the morning of January 15, we again approached the reef and followed it quite closely. Some people were on the reef and barked like dogs when we sailed past them, from which must be concluded that this animal is known to them. Later this view was confirmed. When we noticed an entrance the sloop was sent out to investigate.

While we heaved to and waited for the sloop, several canoes came to us with which we exchanged coconuts, breadfruits, bananas, fish, a cock and what was most peculiar, coconut shells and mussels, which were filled with very good drinking water, which the inhabitants of the island had probably taken not for us, but for themselves. After much hesitation, three chiefs who are here also called iros (urosse), finally agreed to accept our invitation to come on board. For some minutes they were transfixed with surprise and fear, then they picked up a little courage and even made up their minds to enter the cabin, where we gave them several presents and tried to occupy them in every possible manner. They did not have a bit of the amiability of our friends in Kusae.
The figures which were not at all poor-looking made a disagreeable impression because of the restlessness and mistrust with which they were imbued. Their large eyes turned from one side to the other. When an object was given to them as a present, they never wanted to let it go. When we wanted to show them its use. Of course they valued most iron objects made of this metal, especially axes. Several of them tried their strength at the iron faggines, hooks, and winging chains. They certainly wanted to try whether they could get hold of them. The most amiable of all visitors was the iron Lapalap, an old man of about 65, who distinguished himself from the others by his quiet cheerfulness. His leg showed the traces of a serious wound; that makes it probably that interior wars are led among them as on the other high islands of this archipelago. When we set sail to go on, they all went out of the cabin to go to the bridge; for some time they held to the ropes and fortification they one after the other jumped into the water and swam to their canoes.

No suitable anchoring place was found in the inlet which had been investigated; the other, opposite the SW point, which Lieutenant Zavalichine had been able to explore in part only the evening before, promised something better; when passing we stopped there and the same officer was ordered to finish his investigation, and he received order to open a flag on the sloop if he was endangered in any way by the inhabitants. All canoes which had appeared followed our sloop into the bay. After some time we saw that the agreed sign was set, we immediately approached the coast more closely and fired some cannon shots. Lieutenant Zavalichine soon returned to the ship and gave me the following account of his investigation: