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 JAPAN
AREA M - MANDATES

Change #9
 December 1943

600 - Geography
 601 - Physical Features
 130 - Coastal Terrain

CAROLINES (Cont'd.)
 Hall Islands (Cont'd.)
Nomwin Atoll (Cont'd.)

Entrances: There are several entrances into the lagoon:

- a. The SW. Passage is $\frac{3}{4}$ mile in width but 2 shoal patches restrict the use. These shoals are visible. The channel between the main reef and the S. patch is about 400 yds. with least depth of 8 fathoms. The channel between the two patches appears to be deep but there are no soundings recorded. The channel to the N. of north patch does not appear clear. A submarine was reported to have entered through the channel between S. patch and the main reef. Elin Island (center) was brought to bear 93° and stand for. (Chart 5425 is said to be incorrect as the above course would pass over south patch.)
- b. The pass NE. of Elin Island is narrow and apparently suitable for light-draft vessels only.
- c. Pass NE. of Setoaneris Island appears to be about 400 yds. in width and reported 8-10 fathoms deep.
- d. A pass about $2\frac{1}{2}$ miles SW. of Fananu Island appears too shallow except for light-draft ships.

Anchorage: Known anchorages are:

- a. About 1 mile N. of Nomwin Island in lagoon.
- b. W. of Fananu Island, in lagoon. A German vessel reported anchorage at bearings SE. edge Fananu Island 69° , Pisira Island 309° in 13 fathoms. Coral and sand bottom. This indicates error in the H.O. Chart as the point indicated falls on foul ground next to reef. This chart should be used with caution in this area.
- c. SW. of Fananu Island per Japanese report.

Landings: Landings on sandy beaches inside lagoon can be made with due caution against offlying submerged rocks. No landing fields for planes are reported. Seaplane anchorage would require moorings although there is adequate area for landing and take-off.

Population: Native population in 1935 was given as 224.

It is reported that traffic between Japan and Truk passes between Hall Islands and Namomito Islands 75 miles to the W. This gives importance to this group for observation points, also as outposts to Truk.

East Fayu Island, 08-34-48 N., 151-21-40 E. at Obs. Spot, H.O. Chart 5425:

This is a low wooded coral island about $\frac{3}{4}$ mile in length, and 200 to 500 yds. wide, surrounded by a fringing reef, dotted with numerous rocks, from $\frac{1}{4}$ to $\frac{1}{2}$ mile in width.

It has no lagoon or inlets, and evidently its only military importance is that it may be an observation post or anti-submarine lookout.

The island is normally uninhabited. Water is deposited in a small natural basin near the center of the island.

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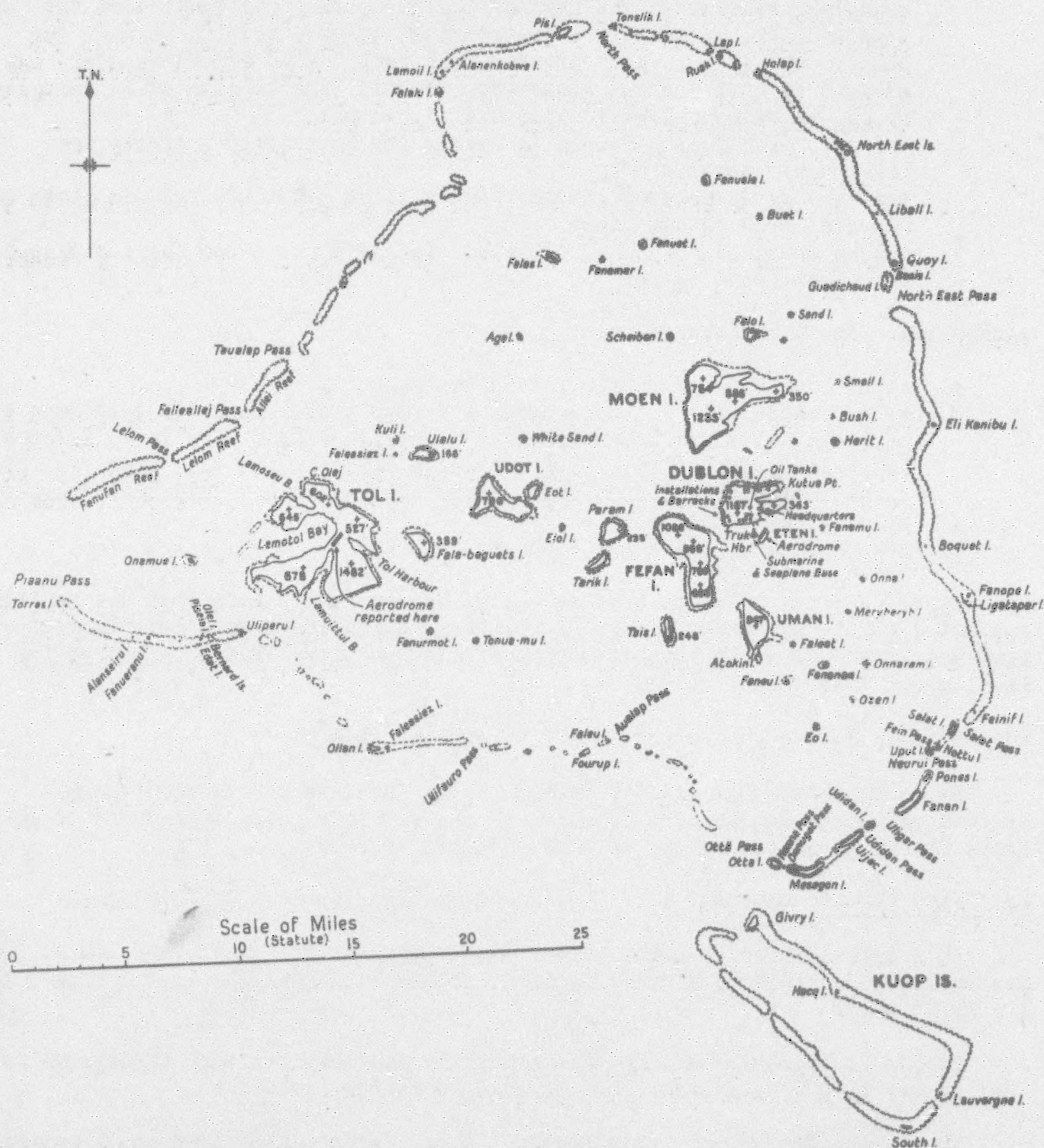
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CAROLINES (Cont'd.)

Truk Islands - 7-21-25 N., 151-53-20 E. at Eten Island H.O. Chart 5424.

This is the largest group in the Carolines. There are mountainous basaltic islands and numerous coral islets with a circular lagoon roughly 35 miles in circumference. The surrounding reef is low, spotted with about 50 islands ranging from 3 to 5 ft. high and covered with a thick growth of coconut palms. There are more islands on the S. and E. than on the N. and W..



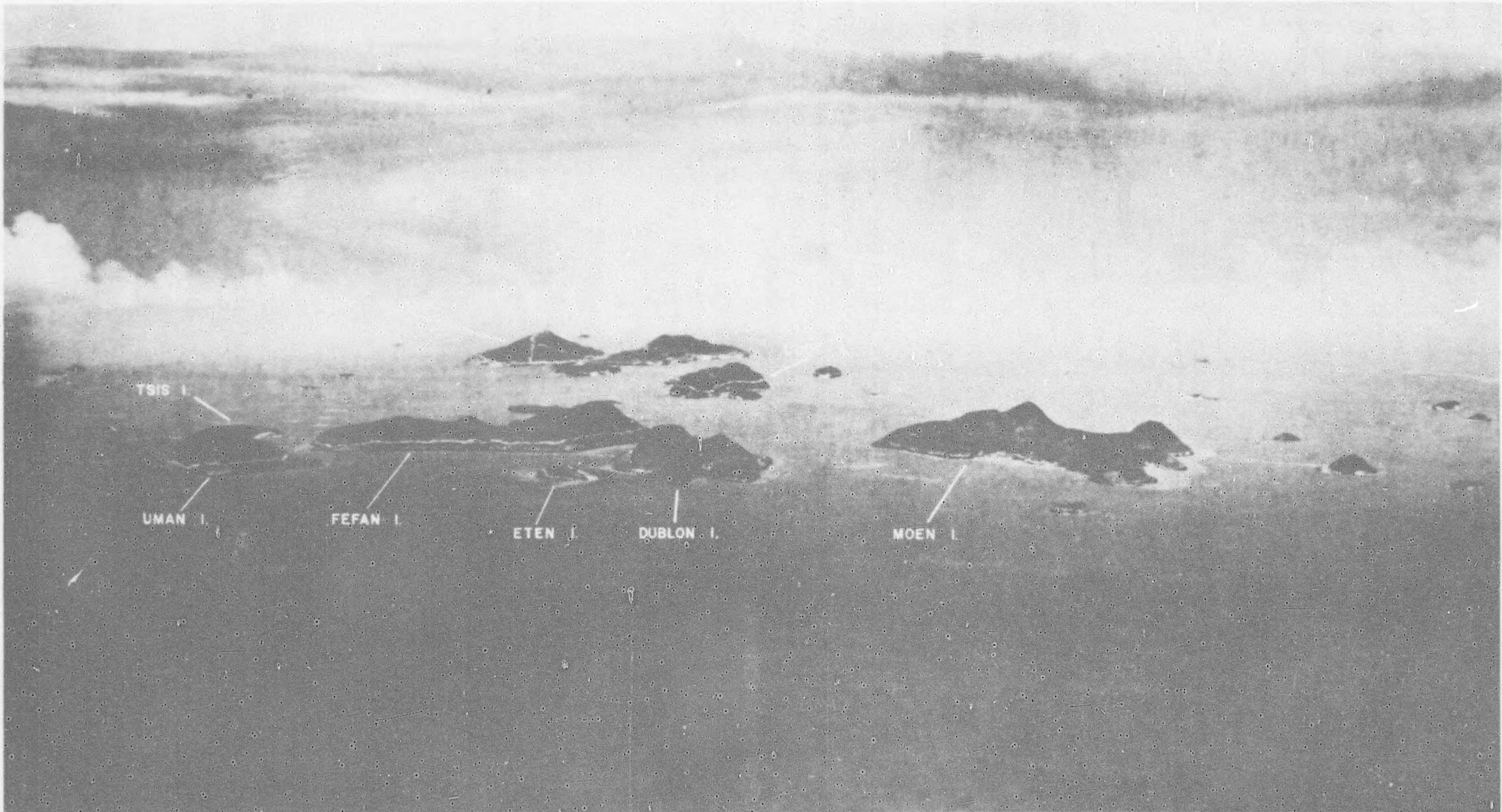
Approaches and Passages: It was reported that approaching Truk from the westward, the first landmark available is the 1430-ft. peak on Tol I. There are about 50 passes through the barrier reef. The most important being: North Pass, the pass W. of Pis Island, Northeast (Motsalap) Pass, Salat (Ulion) Pass,

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CAROLINES (Cont'd.)



TRUK ISLANDS - Model
View from East
Photograph of model based on H.O. Chart 5424

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CAROLINES (Cont'd.)
Truk Islands (Cont'd.)

Uligar Pass, Otta Pass, Ulifauro Pass, Piaanu Pass, Lelom Pass, Falecallej Pass, Taulap Pass. The area between East Fayu Island and the Namonuito Islands is much used by traffic going through North Pass, Piaanu Pass, and that which passes to the westward of Truk without stopping there. Traffic may be routed to the eastward of the Hall Islands on occasions. All Truk traffic to and from the N., NE. and NW. was using North Pass in the summer of 1942. Otta, Piaanu, and Taulap Passes were also observed in use. Northeast Pass is mined or otherwise blocked. (July, Dec. 1942).

Anchorage and Harbors: The entire lagoon forms an unlimited anchorage. In case of strong winds there is ample anchorage in the lee of the islands. The main anchorages in the order of importance are: Eten (S. of Dublon), the roadsteads of Udot, Tsis, Moen (Wela), and the harbors of Tol and Illick. Other good anchorages are: near Kutua Point on Dublon Island, between Fefan and Dublon Island, between Fefan and Param Islands, S. of Pis Island, S. of Falo Island, between Dublon and Eten Islands, W. of Mor Island, off Kukue (SW coast) Fefan Island, between Udot and Tol Island, near the trading station on SW side of Ulalu Island, and off the NW coast of Fala-Beguets Island.

The harbor at Eten, S. of Dublon, is well protected. Small Piers are located at the town and at the S. end of Dublon. The Japanese settlement is at Dublon.

Three new lights have been placed between Moen and Dublon Islands, indicating more frequent use of this anchorage. An ACV (converted carrier) anchorage at Truk is indicated (December, 1942) as distant 2900 meters, bearing 245° from the 700-ft. peak on Moen Island (Harushima). A ship anchorage is indicated as distant 500 meters, bearing 180° from the ACV anchorage.

The large islands within the lagoon vary from 10 to 15 miles in circumference and from 100 ft. to 1420 ft. above high water. They are roughly in two groups within the lagoon, one group to the E. side and one to the W. The E. group N.-S. are:

Moen Island: (Harushima) 7-27-00 N., 152-52-00 E. (Eastern group).

This is the largest and northernmost of the E. group and the best landmark on approach and entering the NE. Passage. It is approximately triangular in shape and points E. with a greatest length of 5 miles. Vidiboen Mt. on the NE. extremity is bare of trees with summit of whitest rock 888 ft. high. The E. slope is gentle while the W. face falls off at 45° angle to Vitunokis Gap separating it from the mountains to the W.

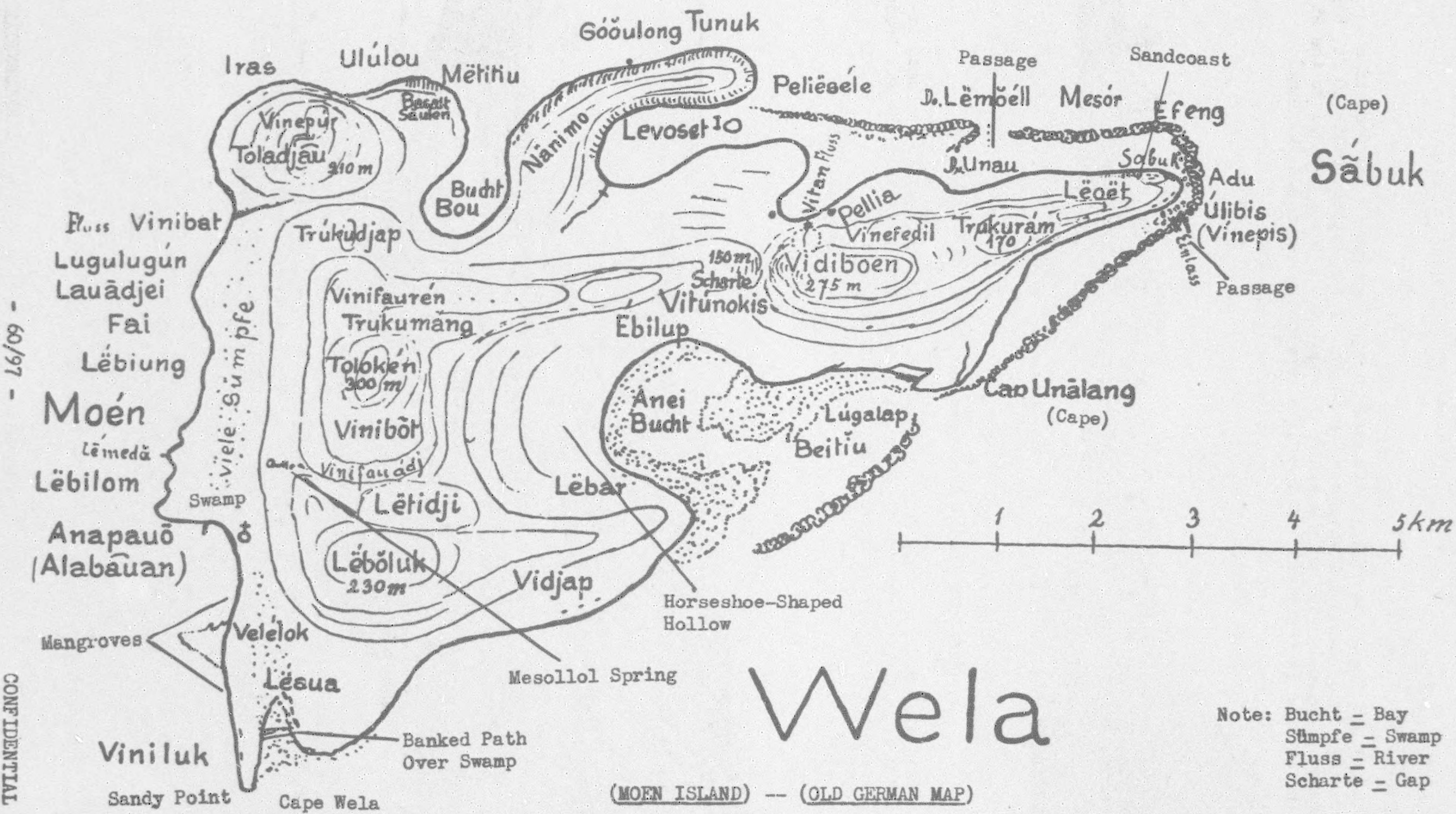
The South shore is indented by Anei Bay, the entrance to which is barred by coral reefs.

The W. coastline runs almost N. to S. except for one indentation near the former mission at Anapauo. It consists mainly of a long sandspit, in part inhabited, behind a projection of the foot of the mountain some 300 ft. wide extends all the way to the shore. Part of the sandbar on the W. coast consists of sandy beach; other portions especially the S. are girt with tangled mangroves. From the mission, a good coast road runs N. to the NW. Cape. It extends S. a short distance and continues as a sandy path up to the Leaua boat-house near the SW. cape. Thence a banked path crosses the swamp between the

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(MOEN ISLAND) — (OLD GERMAN MAP)

Note: Bucht = Bay
Sümpfe = Swamp
Fluss = River
Scharte = Gap

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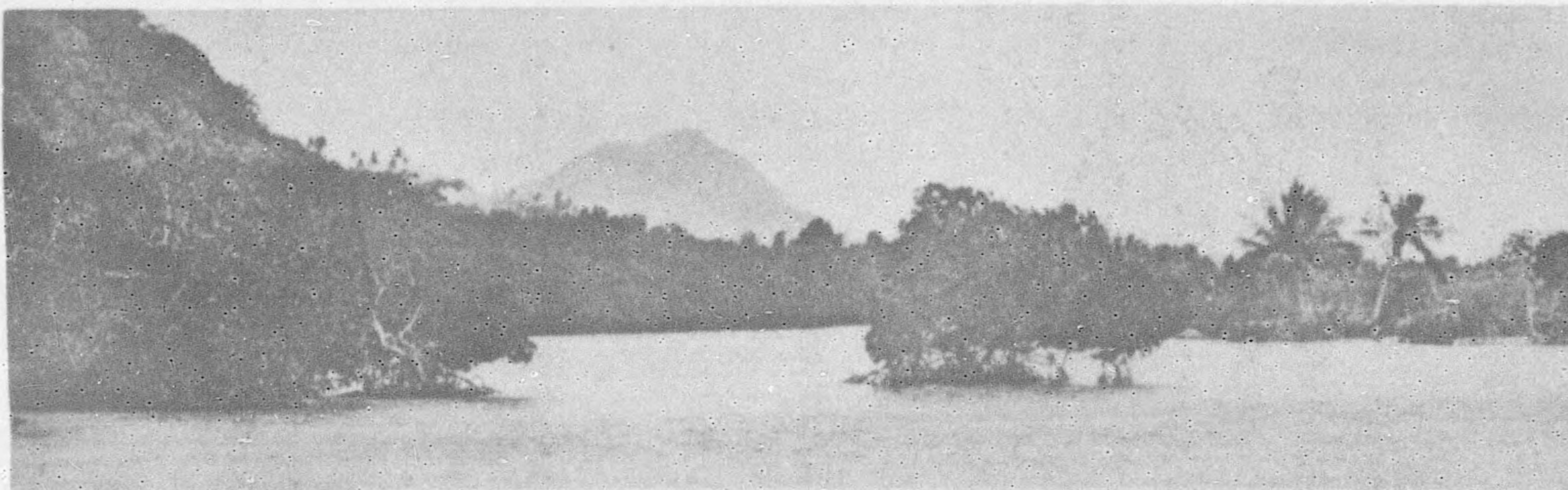
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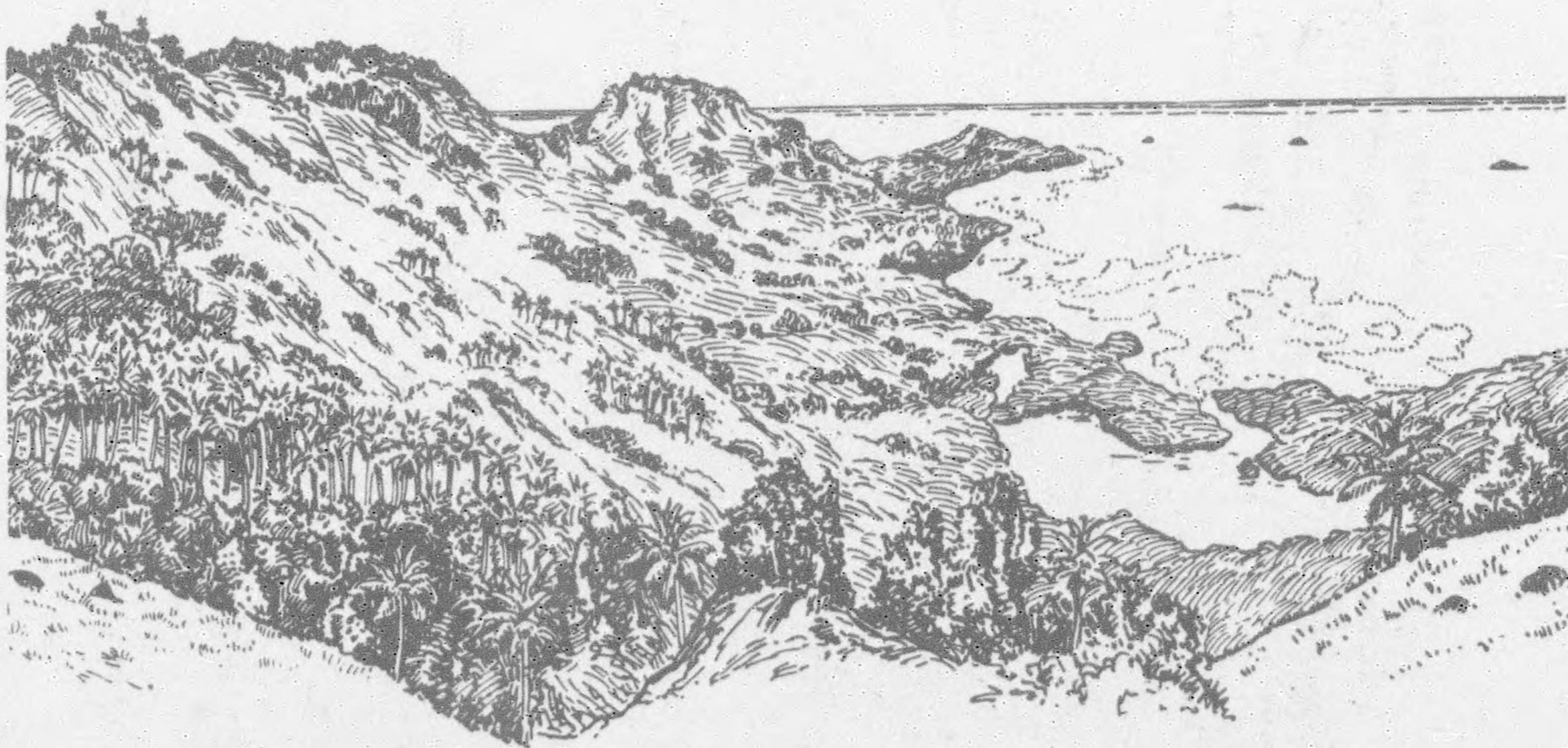
CAROLINES (Cont'd.)
Truk Islands (Cont'd.)

boathouse and the Leaua village situated on solid ground at the foot of a small hill W. of Leboluk Mountain. The summit of the latter about 740 ft. high, commands a splendid view of the entire S. coast and extends a ridge to the NE. At the extreme SW. extremity of Moen is a sandypoint about 300 ft. long.



Mangrove islets along the southwest face of Moen

The water off the sandy portion of the W. coast averages 10 fathoms, except for a projecting reef near Anapaau and being sheltered from the NE. trades, it provides good anchorage except against W. winds.



B. Trukemang B. Vinifaurén Scharte Vitōnōki B. Vidibōn Cap -ābuk
 Cap Unālang Bucht Anel I. Ferrit I. Etelemōkem-k

South coast of Moen (Bucht - Bight; Scharte - Gap).

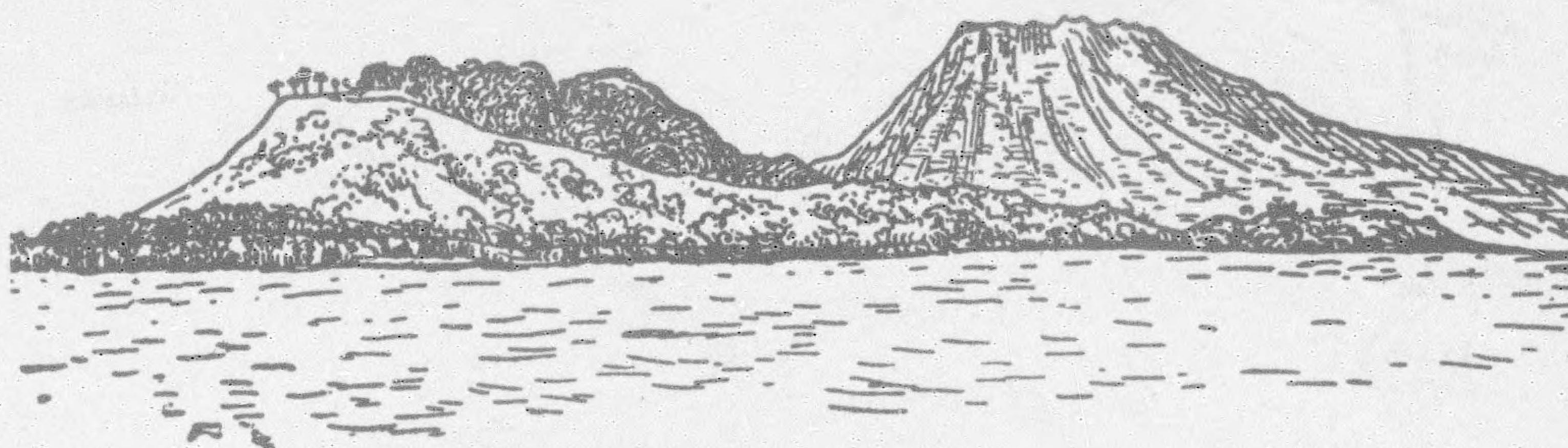
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CAROLINES (Cont'd.)
Truk Islands (Cont'd.)

A range of mountains and ridges runs from S. to N. in the western portion of Moen. Beginning S., there is Leboluk Mountain; then a hill, Letidji; then Vinifauadj; then Vinibot; culminating with Mount Toloken, loftiest peak on the island attaining 1233 ft. N. of the Toloken massif, is the small Trukudjap Hill, but the principal range itself gradually swings E. with the summits Trukumang, Vinifauren and Adjau Boedj. This northern spur of Toloken running E. together with the corresponding eastward spur of Leboluk further S. forms a horsehoe-shaped amphitheatre backing Anei Bay.



B. Leboluk | B. Tolokén | B. Vinifauren | B. Vidiboén
 | | | Pass Vitúnokis

Moen from the south.

On the NW. corner of Moen separated from the Toloken massif by a wide trough running from the Bay of Bou on the N. coast to the mouth of the Vinibat River, rise the twin peaks of Toladjau to the S. and Vinepur to the N. At the summit of Toladjau, 752 ft. high, is a sheer cylindrical cliff 50 ft. high naturally adapted to fortification.

The N. shore is very indented. E. of Toladjau is the flask shaped bay of Bou, further E. the fingerlike Nanimo Peninsula forming a second bay. From the tip of Nanimo a barrier reef runs E. to Cape Sabuk at the end of Moen, with an entrance at Unau, reported 45 ft. deep. On the N. side of Cape Sabuk, a settlement of the same name is situated on a sandy beach about 3000 ft. long between 2 rocky entrances backed by a lagoon of brackish water. Cape Sabuk at the extreme east is surrounded by rocks and reefs.

There are 4 water courses on Moen: The Vinibat Brook rising between Toladjau and Trukudjap Mountains forming a creek several meters deep at its mouth in the NW.; another stream emptying on the N. coast near Levoset behind Nanimo Peninsula; the Vitan flowing N. from the slopes of Mount Videboen with a small waterfall about 3 meters high and a fourth on the S. coast near Cape Unalang. Above the Vitan waterfall, about 150 ft. high are 2 waterholes, the Bonageruk 50 paces long with flowing water, and the Vidjon, reported to be smaller, 500 paces nearer the coast. On the W. coast, 150 ft. above the swamp beneath Toloken is the Mesollol Spring.

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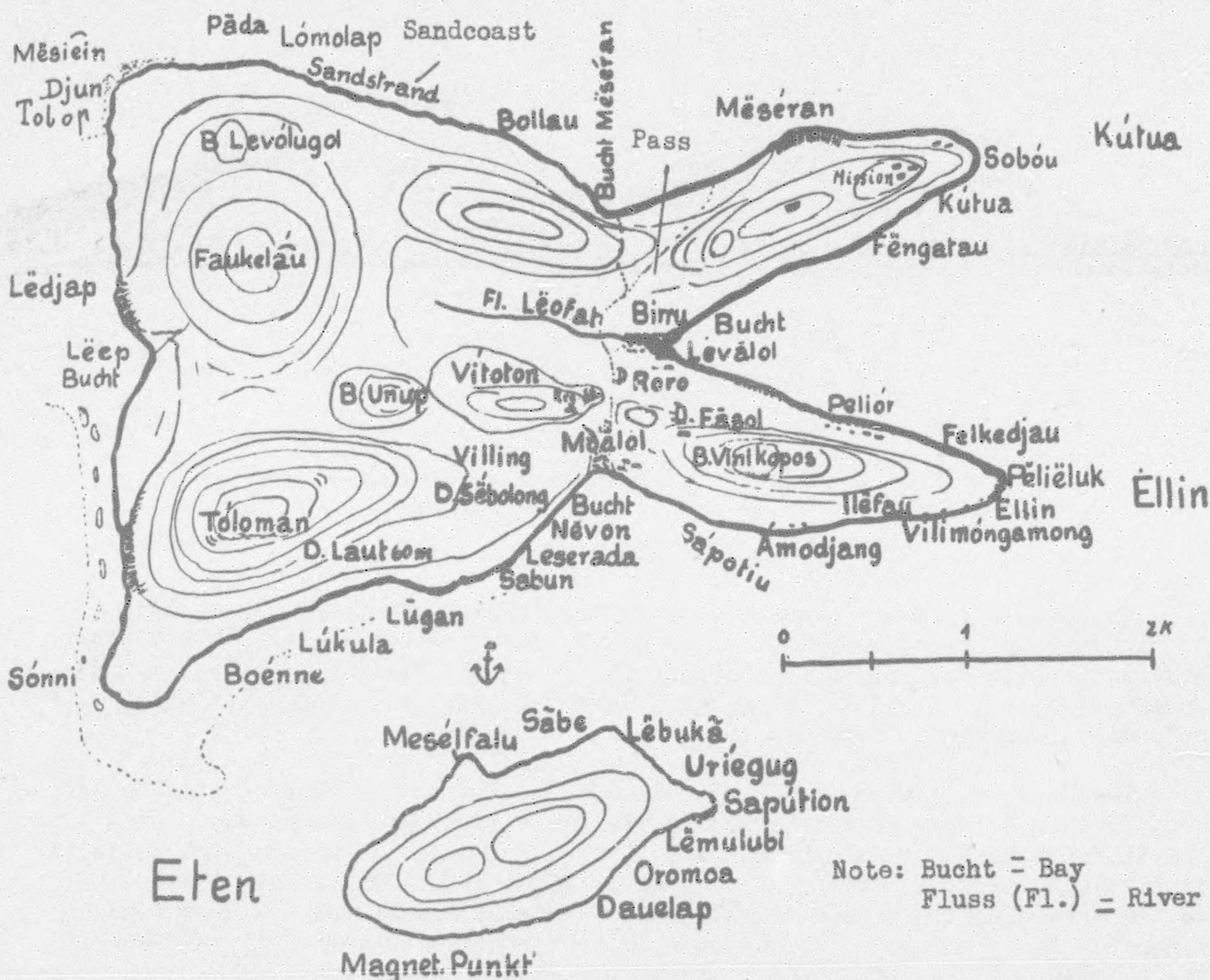
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CAROLINES (Cont'd.)
 Truk Islands (Cont'd.)

Dublon Island (Natsu Shima) - 7-22-00 N., 151-54-00 E. (Eastern Group).

This island is located near the center of the E. group. It is wide on its western side. The E. side is narrow and split into 2 peninsulas with the shallow Levalol Bay between. The only large stream on the island empties into this bay. The maximum length E.-W. is 3 miles and N.-S., about 2 miles. The N. peninsula is called Kutua. The S. peninsula is named Ellin. The Vinikopos Hill extends along practically its entire length.



DUBLON AND ETEN ISLANDS (Truk) - (OLD GERMAN MAP)

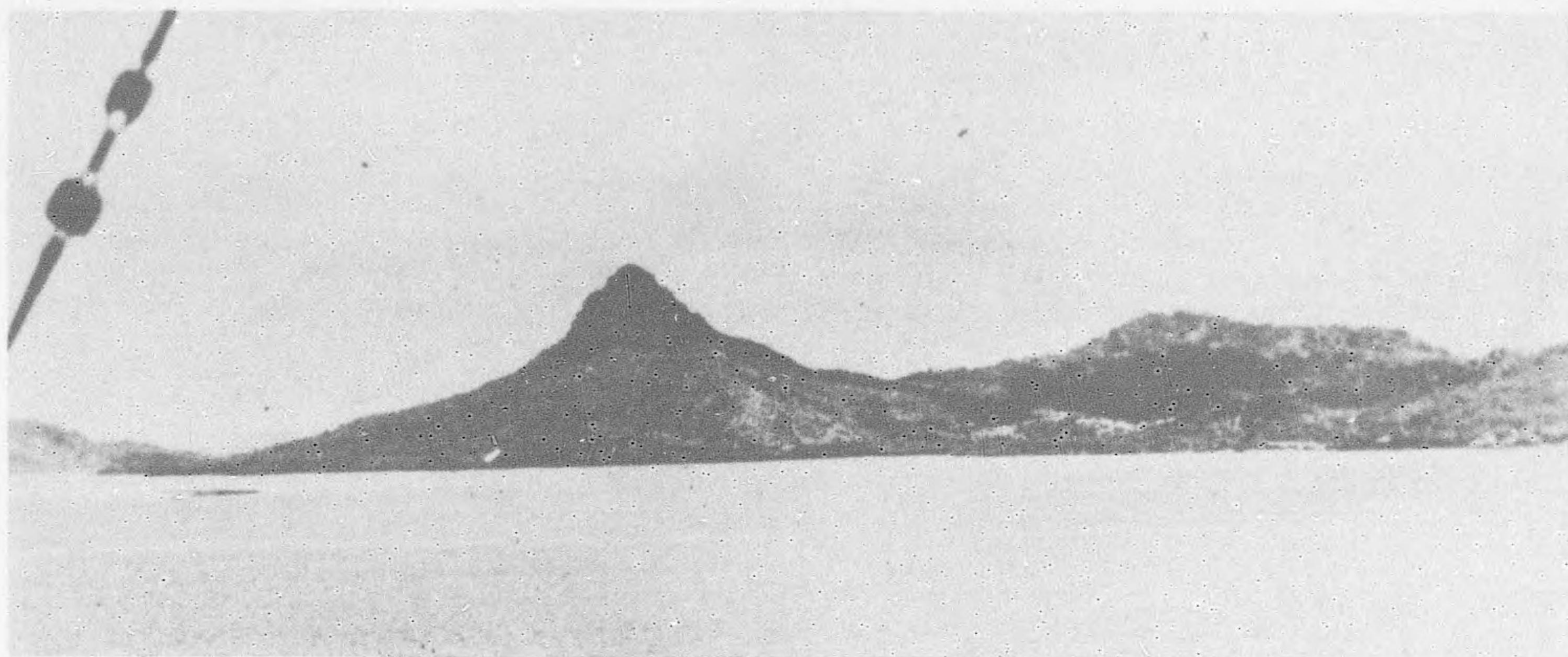
On the SW. part of the island is Mt. Tolomen, 1165 ft. high and in the NW. Mt. Faulkelau. The Unup depression separates the 2 mountains. A pass extends across the island in a NE. direction from Nevon Bay on the S. coast to Meseran Bay on the N. coast. There are several deep caves in the W. portion of the island. On the S. flank of Mt. Tolomen about 260 ft. above the sea is the Ledup Cave, reported in a 1932 publication (German) to be 110 ft. deep and 20 to 30 inches wide. On the N. slope of Tolomen is the Faufaum Cave which is about 65 ft. deep and 10 ft. high. On Faulkelau Mountain a third deep cave is located. These caves have undoubtedly been developed for military storage and use.

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Truk Islands (Cont'd.)



Mt. Tolomen from the Eten Anchorage.

At the foot of Vitoton Hill, N. of Nevon Bay, to the E. and S. are mangrove swamps which are drained by a series of ditches. The bay of Leep on the W. coast was also fringed with mangroves. There is a sandy stretch of beach on the N. coast in vicinity of Lomolap settlement, suggesting possible landing beach. Progress inland could probably be made between Mt. Faulkelau and hill to the E. although hillside offers enemy defense positions.



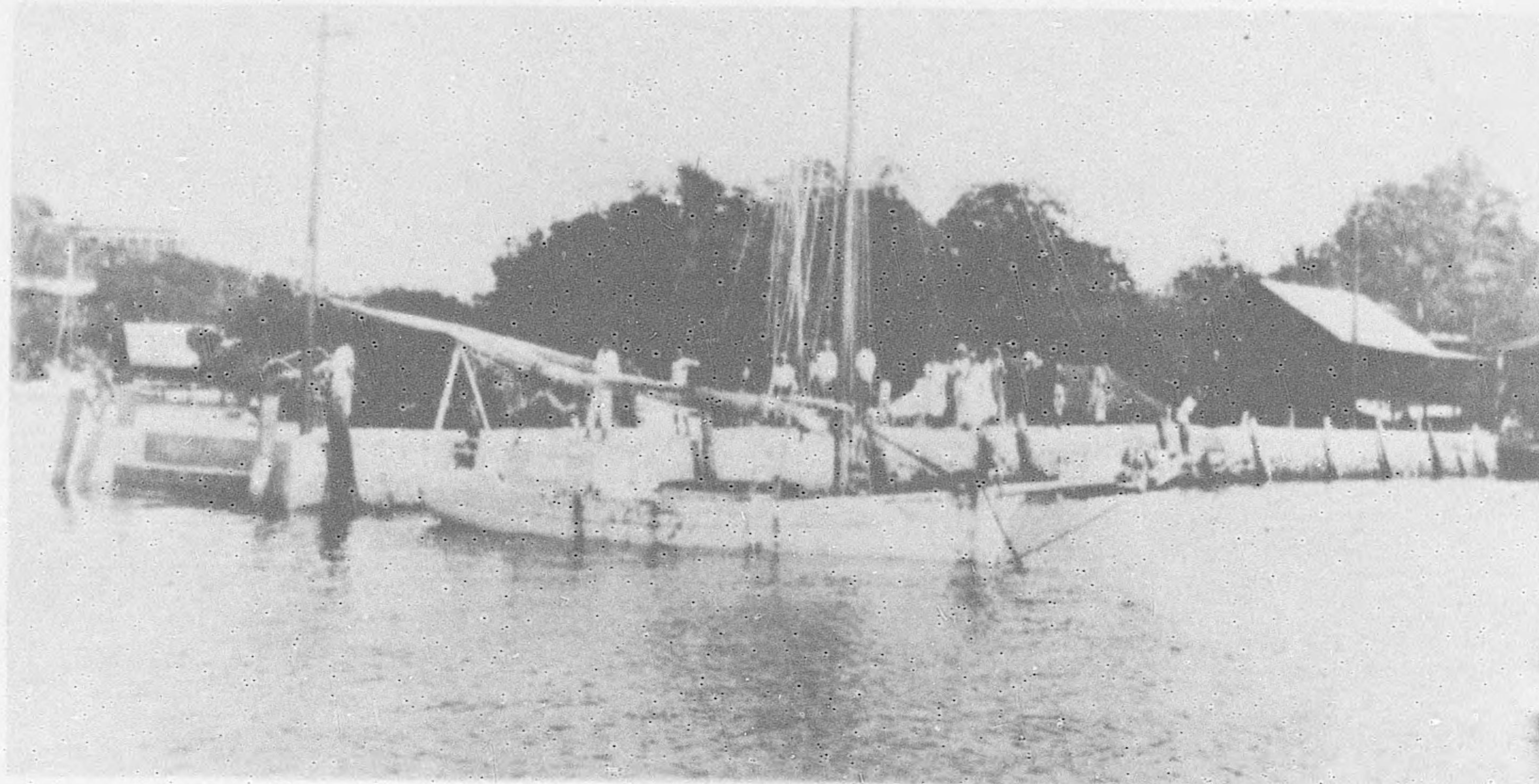
App. Lat. $7^{\circ}23'$ N. - Long $151^{\circ}52'$ E. Looking south at respective tribal dormitories on Dublon Island with ditch in foreground.

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DUBLON ISLAND - App. Lat. $7^{\circ}23'$ N. - Long. $151^{\circ}52'$ E. View northwest across landing stage for Eten anchorage with administration building at left.

Eten Island (Take Shima); $7-21-30$ N., $151-53-30$ E. (Eastern Group).

This is a small oval-shaped island without indentations, about $3/5$ of a mile long running SW.-NE. and lying immediately S. of Dublon Island and Eten anchorage.

On the SW. coast of the island is a point of magnetic disturbance located at a rock of nephelin basalt and magnetite exposed during low water, where the compass needle points S. instead of N.

The only elevation is Peilas Hill (197 ft.) with a small notch in the center of the ridge. Along the NNW. coast a major airfield has been built. This island is just W. of important anchorage area. Approach will be difficult in view of defense installations.



Peilas Hill on Eten Island

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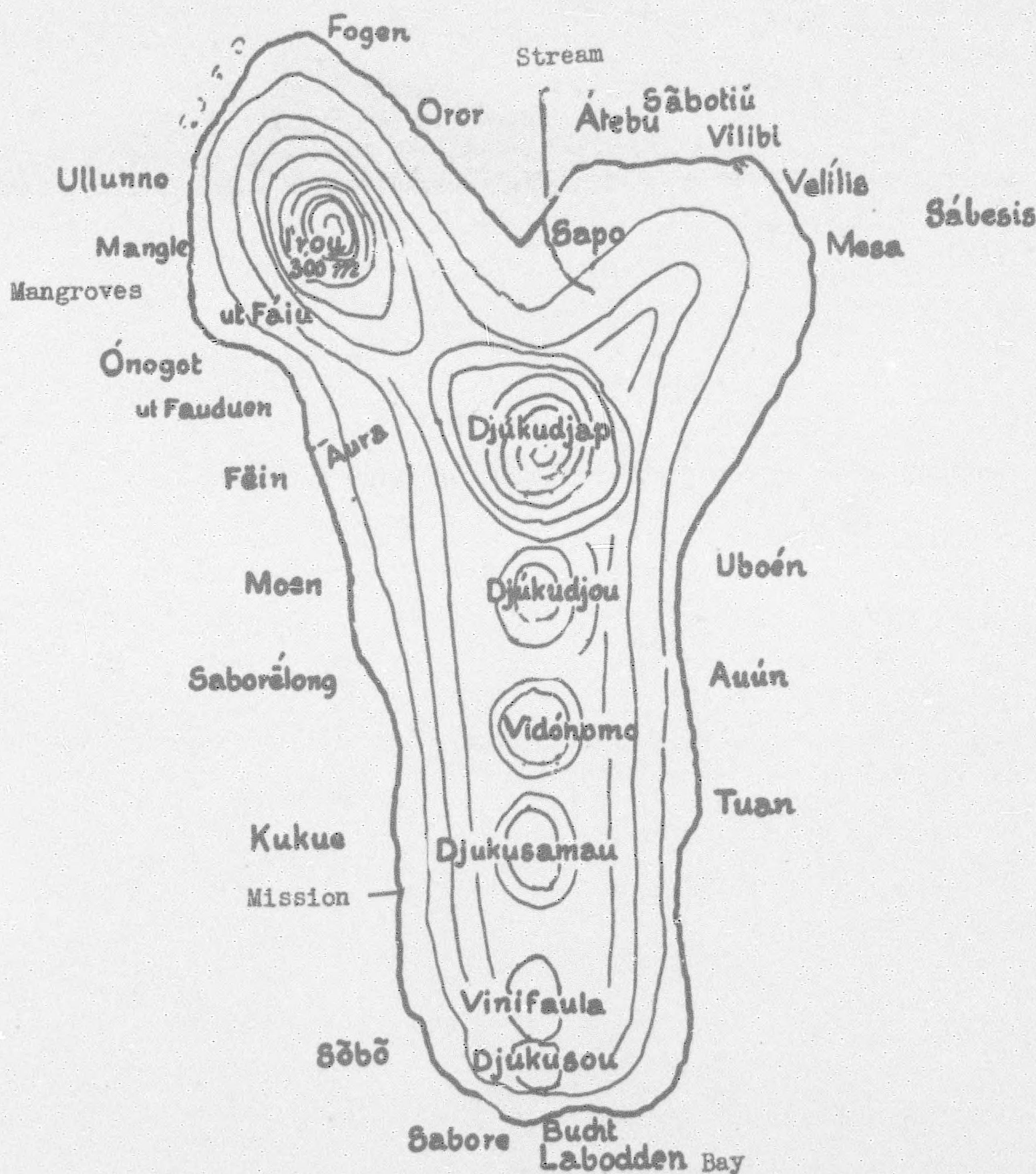
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CAROLINES (Cont'd.)

Fefan Island (Aki Shima) - 7-21-00 N., 151-51-00 E. (Eastern Group).

This island lies immediately SW. of Dublon. It runs N.-S. with enlargement of the NW. part. Its greatest length is 4 miles N.-S. Commencing in the S. there is a series of elevations running N. through the center of the island increasing progressively in altitude up to Mt. Djukudjap (896 ft.) after which the ridge turns NW. and culminates in Mt. Irou (1029 ft.).



km 1 2 3

FEFAN ISLAND - (FROM OLD GERMAN MAP).

Viewed from the E. Djukudjap appears rounded while the S. flank drops off steeply to the SE. near the coast. Mt. Irou appears as a pyramid from the N. From the S. the peak rises gradually from the W. with a precipitous drop to the E. A good anchorage is reported off the Kukue Mission on the SW. coast. Between Dublon and Fefan there are many reefs which may have been

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Fefan Island (Aki Shima) (Cont'd.)

blasted by the Japanese to clear the passage. A small stream, Sapo, empties near the center of the N. shore.



Looking north across northwest point of Fefan I. toward
Moen (Wela) I.

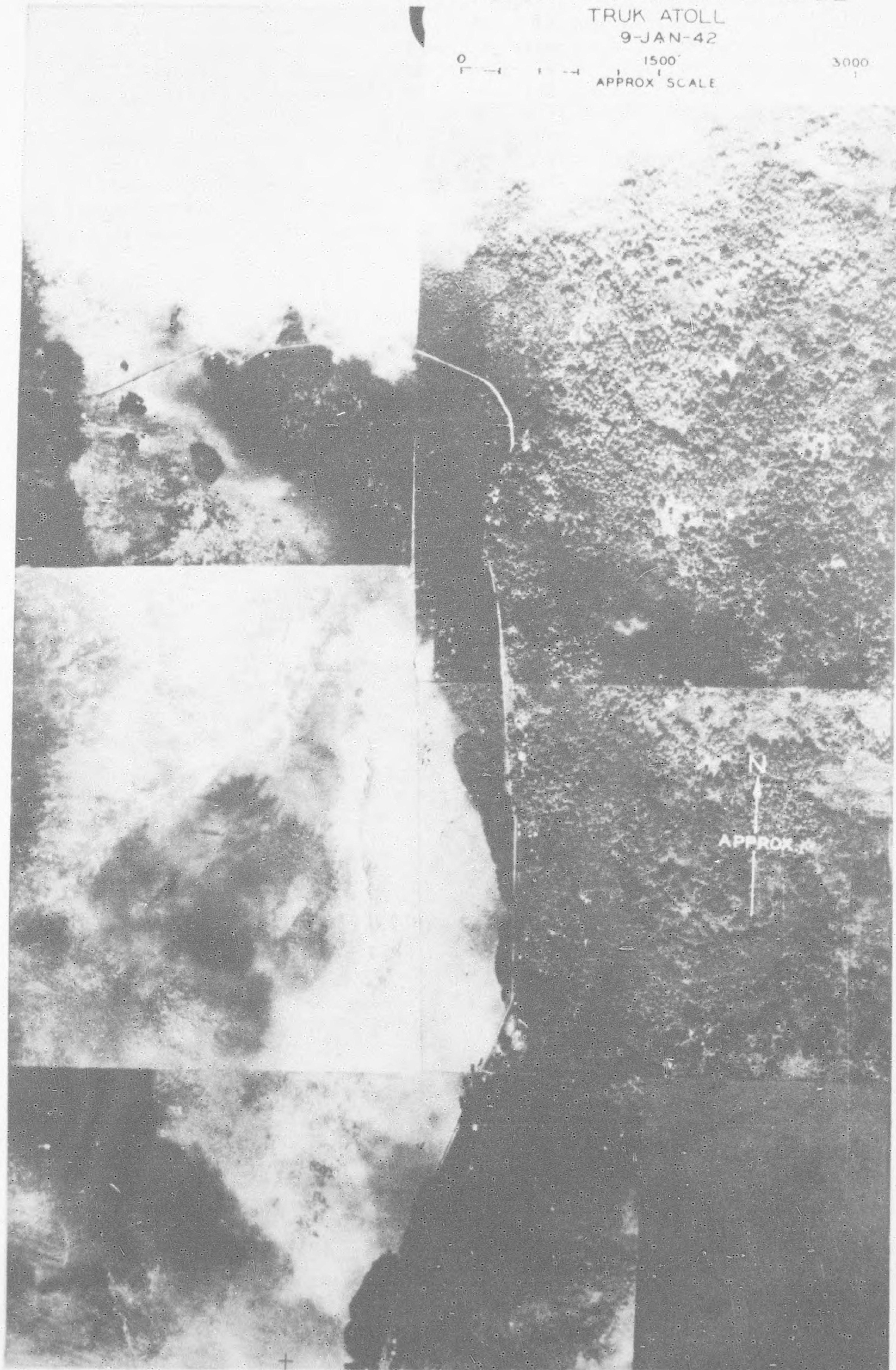
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CAROLINES (Cont'd.)
Fefan Island (Aki Shima) Cont'd.

FEFAN ISLAND WEST SIDE
TRUK ATOLL
9-JAN-42
0 1500 3000
APPROX SCALE



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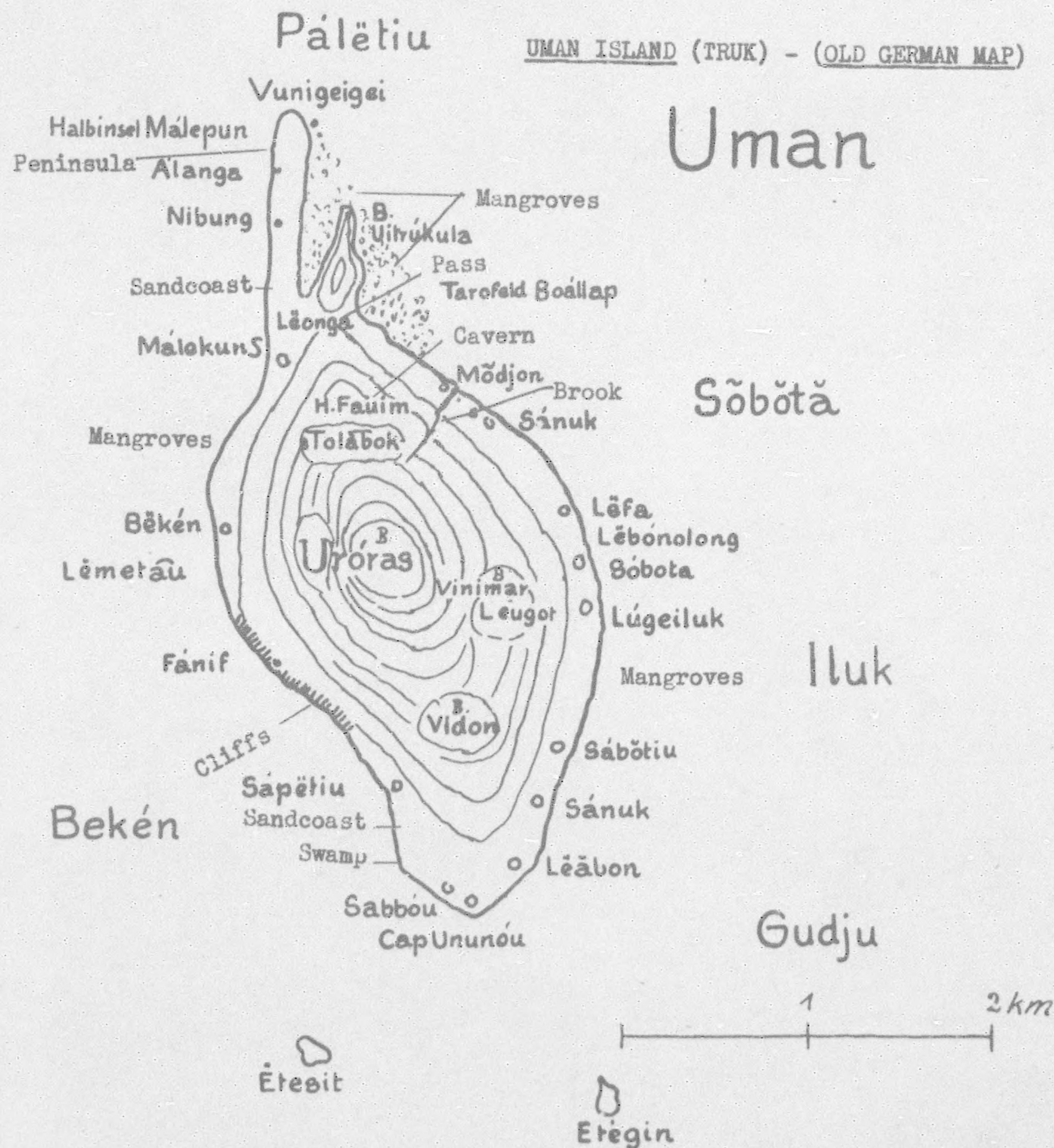
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CAROLINES (Cont'd.)

Uman Island (Fuyu Shima) 7-18-00 N., 151-53-00 E. (Eastern Group).

Southernmost of the main E. group. Runs N.-S. with greatest length $2\frac{1}{4}$ miles. The island is dominated by Mt. Uroras (945 ft.) which covers most of the island with its terraces and ridges. In the extreme N. a sandy peninsula juts out $\frac{1}{2}$ mile. Immediately to the E. is a shorter peninsula with small volcanic hill, Uitrुकula. Between the 2 peninsulas as well as S.-E. beyond Uitrुकula are thick mangroves and swamp. The Leonga Pass, about 65 ft. high separates Uitrुकula from the Uroras massif. The sandy coast W. of Leonga Pass and the NW. point of the sandy pit seem to be suitable for landing operations. Progress inland would be retarded by terrace-like terrain. Leonga Pass offers access to the NE. and E. coastal area from a NW. coast landing. The E. and W. faces of Uroras are very steep.



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Uman Island (Fuyu Shima)(Cont'd.)

This peak can be ascended by route of a small hill (185 ft.) on the N. flank, thence E. to Leugot shelf then via a depression up the Vinimar height, then to 2 rocks called Baumoaan and Baufefin by the natives from which a path leads to the peak.



TRUK - Shoreline of Uman Island. Mountains of Fefan in background.

On top were walls 1 meter high and wide, at one time ancient native fortifications. Descent can be effected over the northern slope via Tolabek height from which point descent is steep. On the N. slope at an altitude of about 250 ft. is the Fauim Cavern between 9-12 ft. in height.

A wide path, stony on the W., encircles the island. At Fanif in the SW. cliffs run along the shore for about 3/5 of a mile. Between Sapetiu and Sabbou in the SW. there are sandy and swampy flats with native boat houses formerly on a small sandy peninsula. This area appears to offer a beach for landing operations. Objectives here would be reported but unconfirmed landing field and seaplane base.

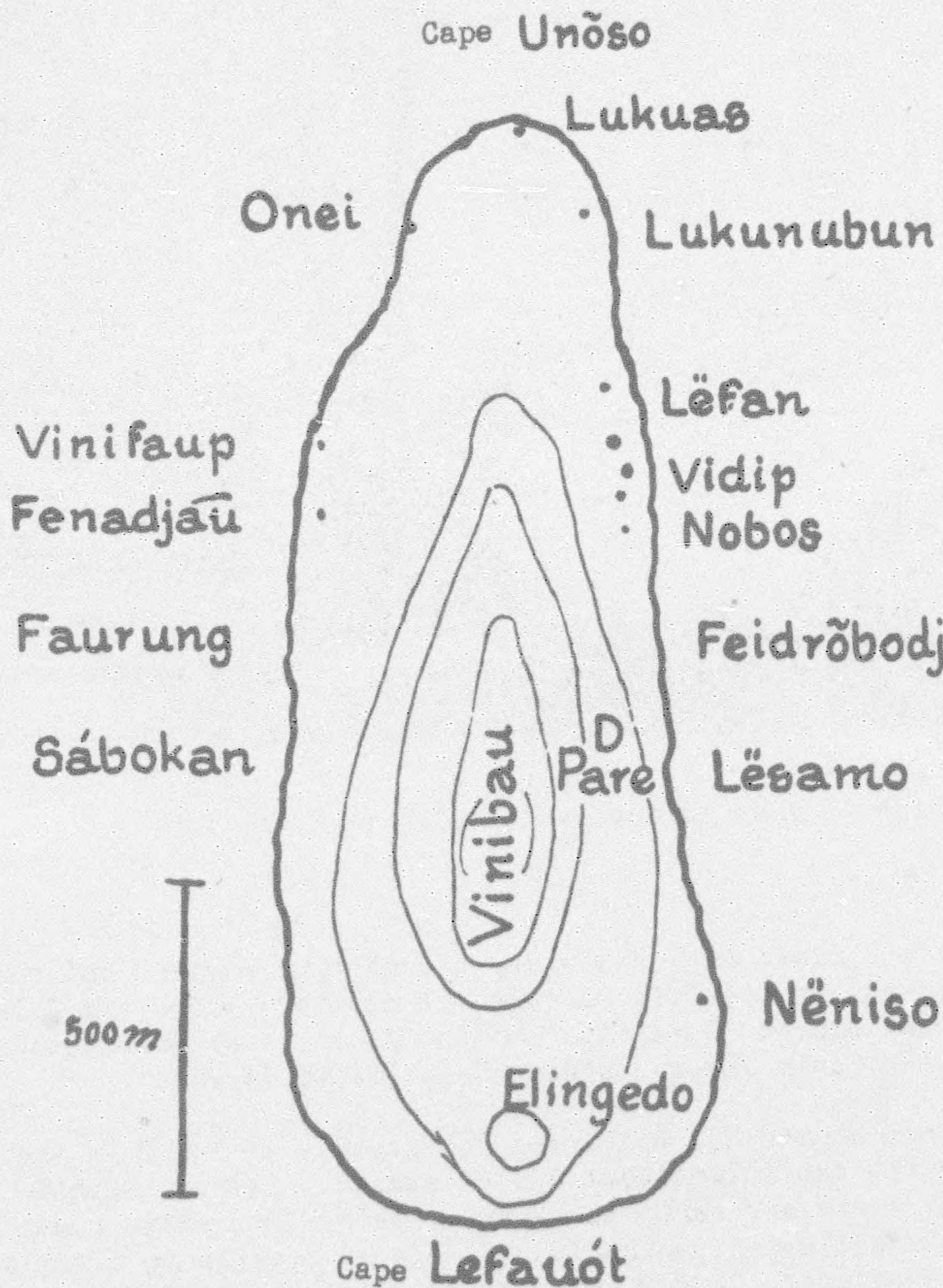
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Tsis Island (Susuki Shima) 7-18-00 N., 151-49-00 E.

(Eastern Group) This is a small shank-shaped island, one mile long, running NW.-SE. about 1 N. mile SW. of Fefan. The highest elevation, Vinabau, 247 ft., runs along the center of the island with a plateau of 300 ft. wide on the top. There was a native boathouse on the E. coast at Lesamo from which ascent can be made to the Pare Hill at the N., thence S. to the top of Vinibau. At the extreme S. there is a small hillock Elingedo, on the W. side of Tsis is a roadstead with 20 fathoms depths in many places. There is no report of emplacements. This island overlooks several passes in the S. and SW. reef and the main islands of Uman and Fefan on the N.-NE. Occupation and denial to the enemy of Tsis might be a part of enveloping strategy against the main islands.



TSIS ISLAND (TRUK) - (OLD GERMAN MAP)

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Udot Island (Getsuyo To) 7-23-00 N., 151-43-00 E.

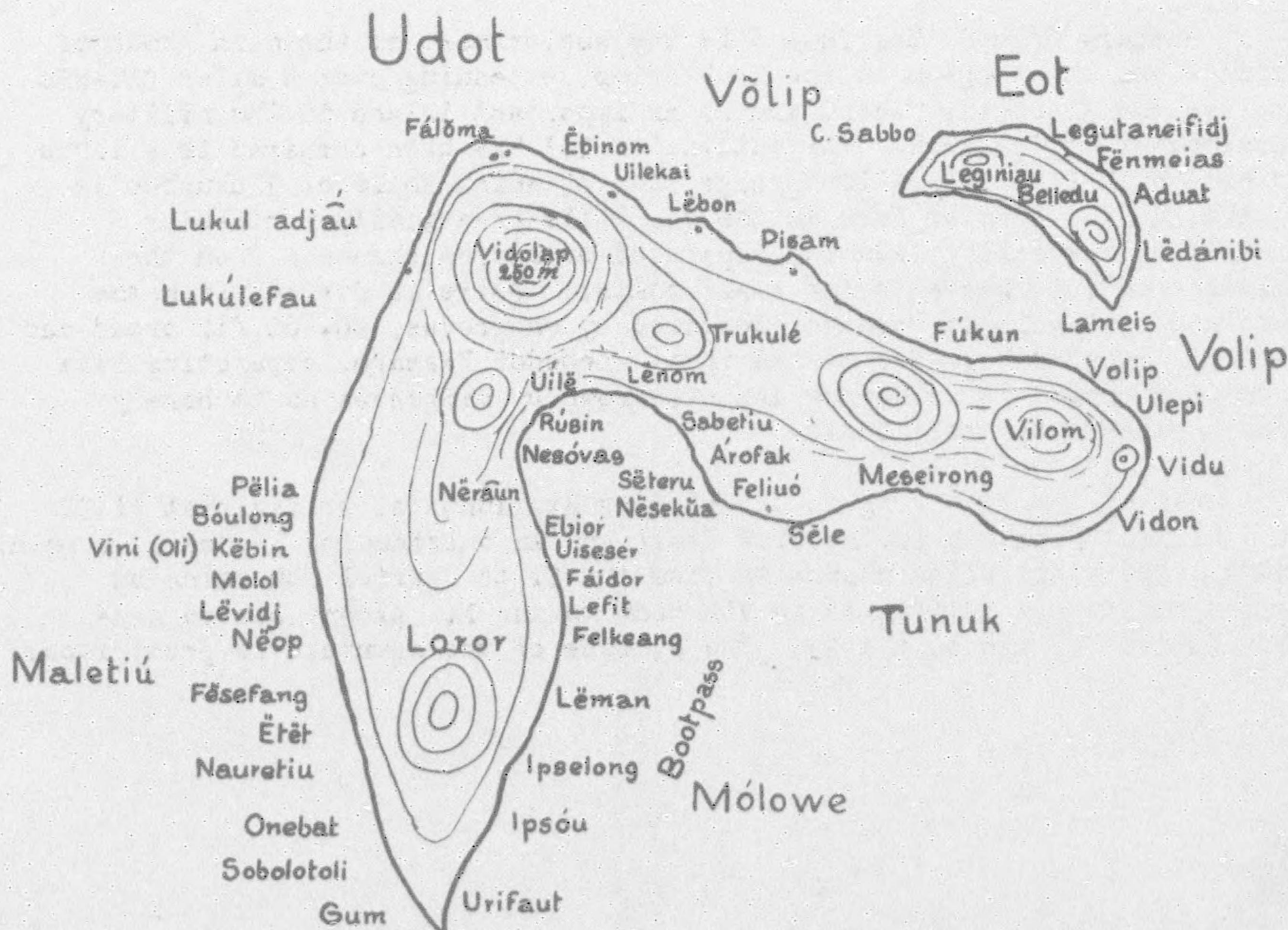
(Western Group) This island is midway between Fefan and Tol and almost in the center of the atoll. The greatest length is 2 3/4 miles; Udot has the outline of an angle with the opening between the two sides to the SW. Mt. Vidolap (796 ft.) lies at the N. point. To the E. forest extends well up its slope. There is a small waterfall at about 300 ft. Spurs about half the height of the peak reach out to the SE. and SW. respectively. A low neck of land connects Vidolap Mts. with the two projecting sides of the angle. The SE. prong has 2 elevations, Trukule (about 575 ft.) and Vilom (about 325 ft.).



UDOT from the south.

Eot Island (Western Group)

N. of the SE. point of Udot lies the small island of Eot about 2/3 of a mile long with a maximum elevation of 245 ft. Reefs fill the channel between the 2 islands but there is good anchorage to E., between Eiol and Eot Islands with depths up to 13 fathoms.



UDOT AND EOT ISLANDS (TRUK) - (OLD GERMAN MAP)

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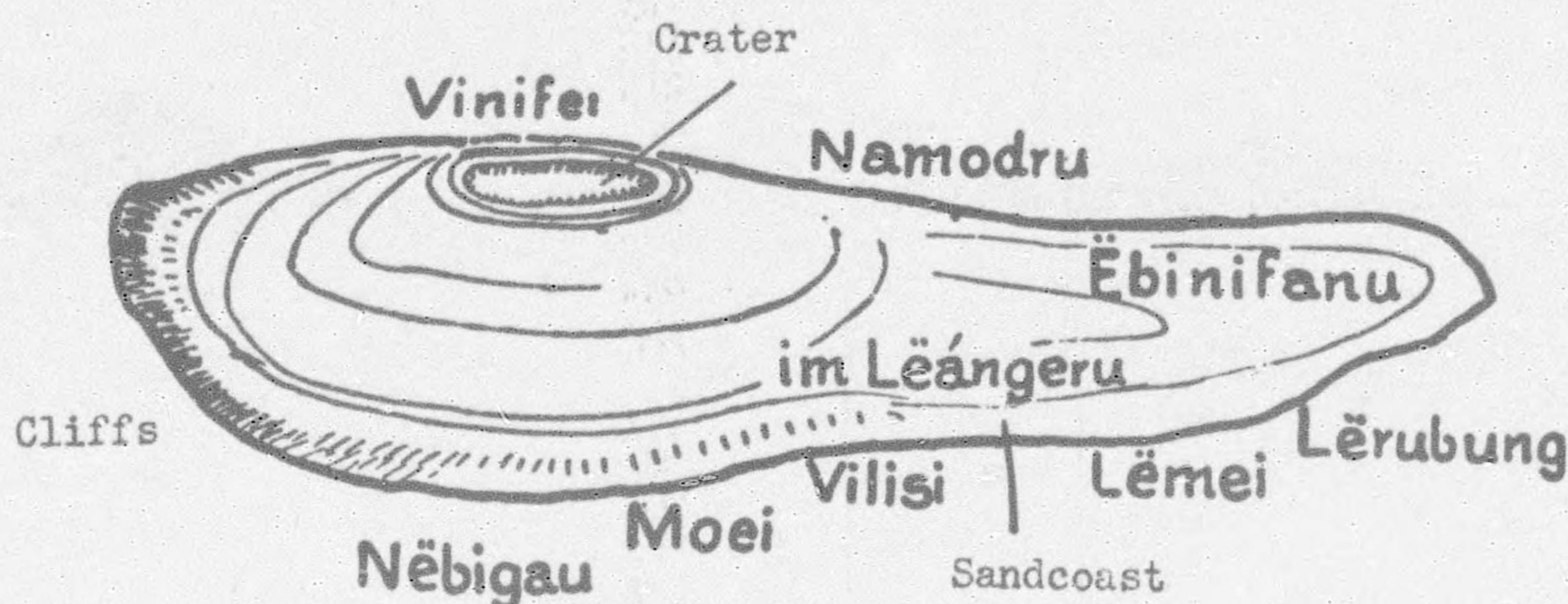
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CAROLINES (Cont'd.)

Ulalu Island (Nichiyō To) 7-25-00 N., 151-40-00 E.

(Western Group) Ulalu is a small island, 1 mile long, roughly oval in shape, about 3 miles NE. of Tol Island. It rises gradually from E.-W. with an oval crater-shaped hill, Vinifel, on the NW. coast, with a maximum elevation of 168 ft.

Cliffs along the SW. shore near Negibau, Moei, Leangeru and Vilisi settlements give way to flat sandy coast to the E. at Lemei. There are reefs between Tol and Ulalu. There is an anchorage off the SW. coast opposite a trading station.



ULALU ISLAND (TRUK) - (OLD GERMAN MAP).

Tol Island (Suiyō To) 7-21-00 N., 151-37-E.

(Western Group) Tol Island is the westernmost of the main group of islands and the largest in the Truk Group, extending over 6 miles SW.-NE. It lies due E. of the Piaanu and is an important island in the military development of the area. The outline of Tol has been compared to a large orchid, with five petal-like prongs, two of which Polle or Ilukunboelle in the SW. and Pata or Pada in the NW. while practically peninsulas are strictly speaking islands, separated by narrow channels from the mainland of Tol, passable for small boats. Polle is divided from the mainland by the Leaut Passage, bordered by mangroves, 60-100 ft. broad and 1600 ft. long with gentle meanderings. Lebedei Passage, separating Pata from Ojei (Onei) is so narrow and overgrown by mangroves as to barely permit passage by small boats.

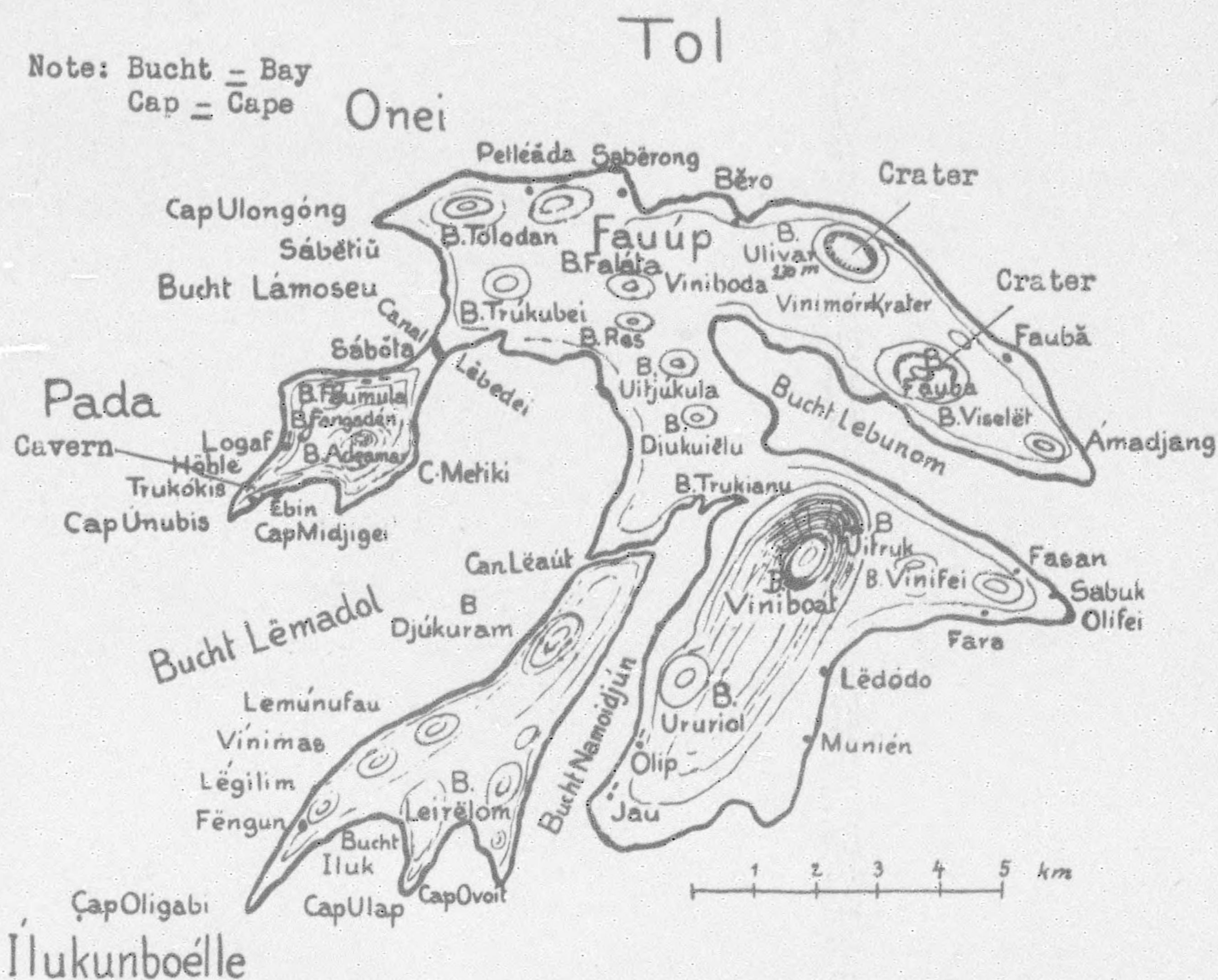
Most of the SE. prong is occupied by Mt. Tumuital or Viniboat (1422 ft.) highest mountain in the Truk atoll and an outstanding landmark, running SW-NE. The ridge rises gradually from the S. to Ururiol Mountains on Namoidjun Bay and culminates in Viniboat to the N. Ascent can be made from Munien Village on the SE. The N. face of the mountain is precipitous.

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CAROLINES (Cont'd.)
Tol Island (Suiyo To) (Cont'd.)



TOL ISLAND (TRUK) - (OLD GERMAN MAP)

Between the SE. prong and the projection called Polle (Illukunboelle) lies the long narrow bay of Namoidjun with many coral reefs, especially in the upper reaches and a number of mangrove islets. Polle has 3 finger-like capes: Oligabi, Ulap and Ovoit. On Cape Ovoit, is a small knob Tunuit, and back of it, Leirelom Hill. Along the W. coast of Polle, NE. from Cape Oligabi are a series of elevations, Legilim, Vinimas and Lemunufau, culminating in Mount Trukulam (Djukuram) 679 ft. high. Between Capes Oligabi and Ulap is Illick Harbor with 9 to 27 fathoms.

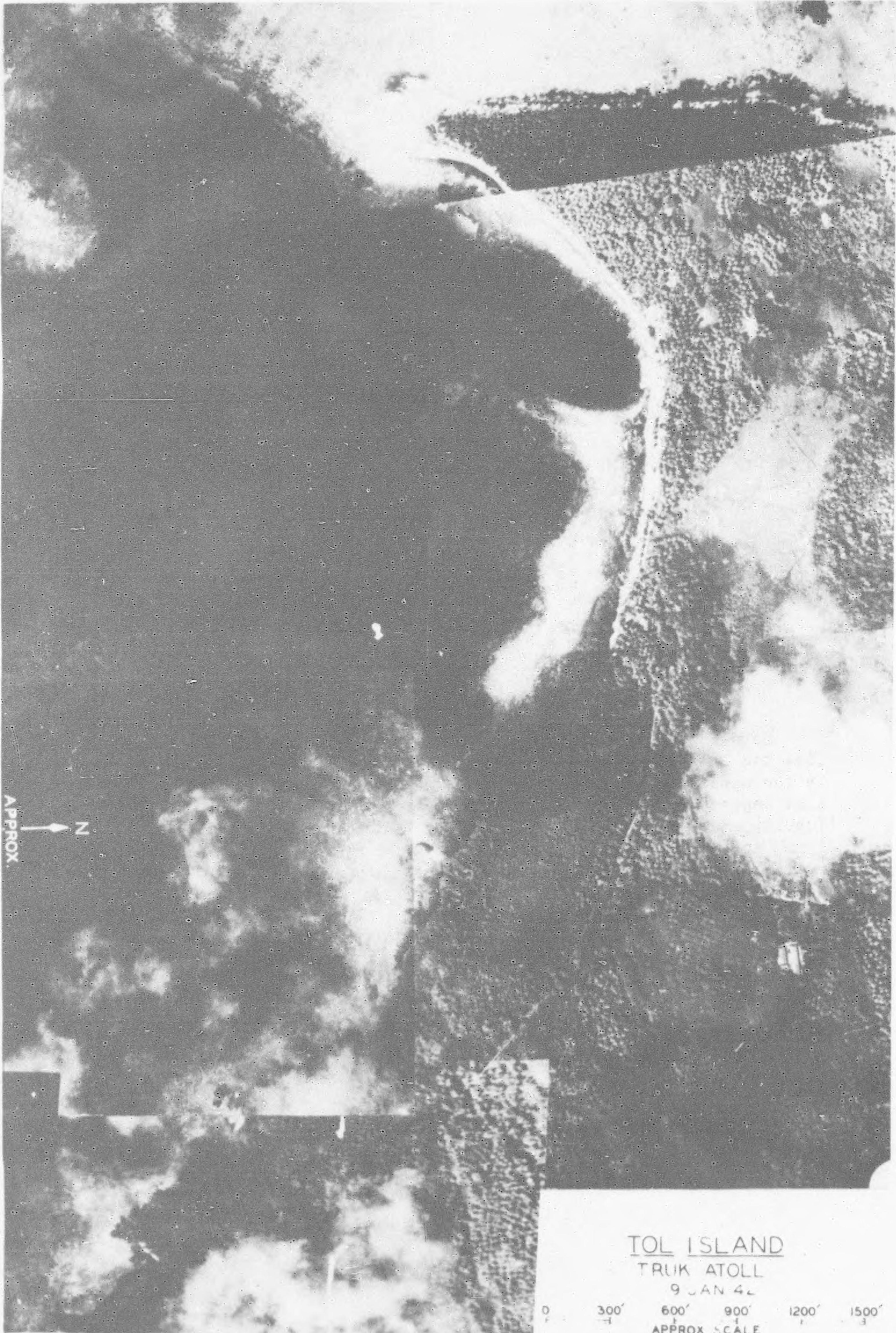
Across the broad bay of Lemotol is the rugged diamond-shaped projection Pata with summits of Fangaden and Faumula in the NW. and Adeemar (679 ft.) to the SE. The ridge declines sharply to the NE. and only a low isthmus, out by the Lebedei Canal connects with Ojei (Onei). Near the western end of Pata at Cape Unucis lies Trukokis Hill, the ridge of which is pierced by the Lefauim Cavern, 50 meters long by 7-10 meters wide.

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TOL ISLAND

TRUK ATOLL

9 JAN 42

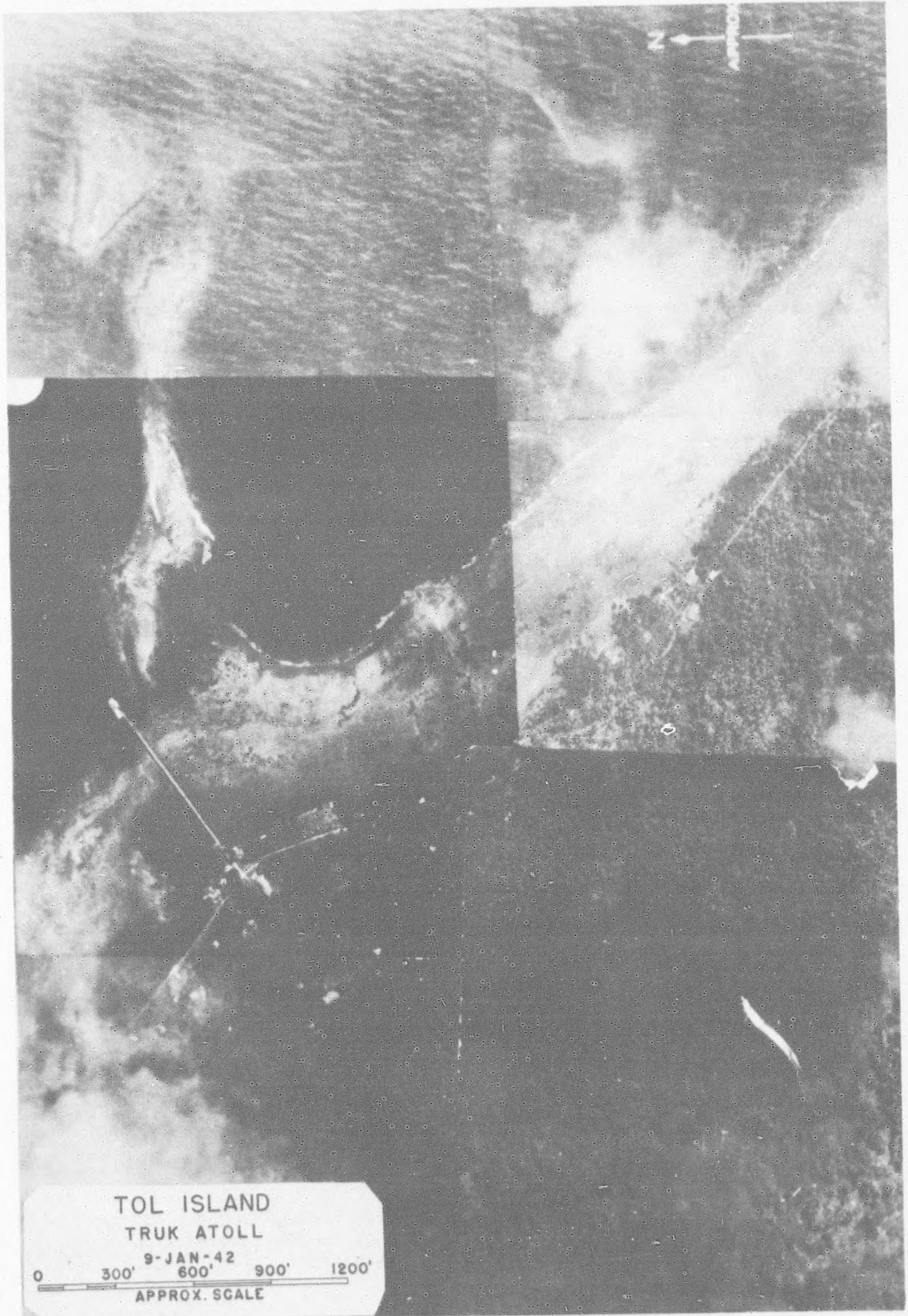
0 300' 600' 900' 1200' 1500'
APPROX. SCALE

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Between Pata and Onei, the northernmost prong of Tol lies Lamoseu Bay, with Cape Olej (Ulongong) in the NW. At Sabetiu near the cape on Lamoseu Bay, is a landing place for boats. On the N. shore of Cape Olej is a stretch of stony coast. Three major elevations on Olej are: Tolodan Mt., Fanado Mt. (602 ft.) Trukubei, extending SW. from Fanado. E. of Olej on the S. slope of the Viniboda and Ulivar Hills, at an altitude of some 250 ft., lies the village of Fauup from which the land rises to a high plateau on Ulivar (420 ft.). The N. face of Ulivar drops off perpendicularly from 65 to 100 ft., making it appear like a rampart from the N. On the N. shore on bights of the same name the settlements of Saberong and Bero are located, from which a road runs S. via Fauup to the village and hill of Uitjukula (150 ft.).

From Fauup, the Amadjang Peninsula runs to the SE. separated from Mt. Viniboda by Lebunom Bay (Tol Harbor). On Amadjang are two extinct volcanic craters: Mt. Vinimorr (527 ft.) and Mt. Fauba, of somewhat lower height and to the SE. At the extreme SE. end of Amadjang is a hill, Viselet.

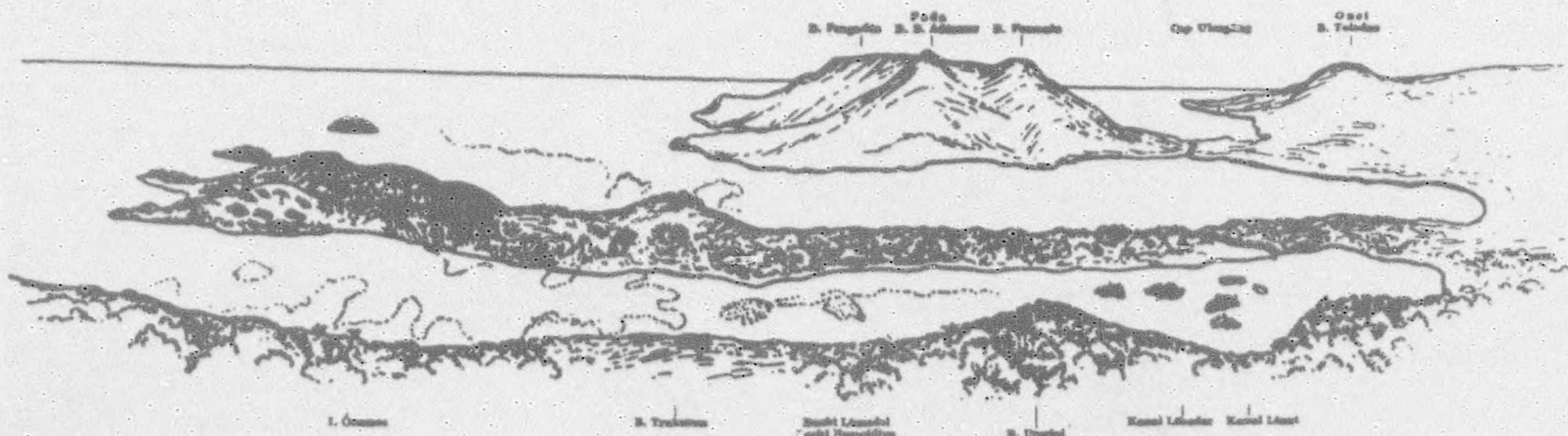
N. of Fauba and toward the Fala-Beguets Island are numerous distinct knob-like reefs.

To the S. of Amadjang is Lebunom Bay (Tol Harbor) with depths of 7-15 fathoms in the center and reefs fringing the shore. On the S. shore near Fasan, were two native boathouses, one of which Logaf had a stone pier for small boats.

Tol Island, because of its size, terrain and position, is important in the operations in Truk Islands.

Pis Island - 07-40-00 N., 151-46-00 E.

(Western Group) This small island on the barrier reef just W. of N. Pass is low and oval-shaped. It is covered with thick vegetation. There is a narrow canal dividing the island. The island is flanked on its sea face by a high coarse shingle beach, while on the lagoon side it is edged with a fine sand beach on which natives draw up their canoes. Sandbars and spits flank the island offering limited areas for landings. This island overlooks North Pass and landings here would be a first step in controlling that entrance.



View from SW. to NW. from Viniboda Mountain.

The foregoing covers the coastal and interior terrain features of the principal islands of Truk Atoll. This area is further developed in Sec. 602, 603 and other pertinent sections. See index.

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CAROLINES (Cont'd)

Namonuito (Onon, Ulul, Olol, Ulol) Islands: 8°-35'-N., 149-39-28" E.
 H.O. Chart 5422.

This group is about 76 miles W. of Hall Islands, is of triangular form with the apex to the N. and the base extending 45 miles E. and W. The depths inside the lagoon vary from about 5 to 36 fathoms, the reefs being easily recognized by the discolored water and the state of the sea over them. The reef forming the atoll has general depths of over 5 fathoms over it so that the appearance of the inside of the lagoon does not differ from that of the sea outside. Ulul is the largest island of the group. Ulul is $2\frac{1}{2}$ miles long and 200-900 yds. wide. $\frac{1}{2}$ mile N. of Ulul Island is a rock, Ose, is awash at high tide.

Entrances and Anchorages: Potential seaplane anchorage and landing fields. The lagoon can be entered nearly anywhere but, because of shoal spots and lack of landmarks except in the vicinity of the islands, it is probably best to make a landfall on one of the islands. Two good entrances are:

- a. the one lying 8 miles W. of Pissaras, leading to Onari and Magur.
- b. 6 miles SE. of Magur, leading to that island.

Tender anchorages might be had off the E. coast and W. shores of Ulul Island. It would appear that there are anchorage depths for any number of ships in the lagoon. No place where protection can be had from more than one direction at a time.

Landings: Landings could be made with small boats at either end of road across Ulul Island. Not enough protection to moor a floating dock.

Seaplane Anchorage: There is unlimited area for landing and take-off of seaplanes but there is little shelter. Ulul Island - potential anchorage and mooring areas on both E. and W. sides. Depths 18 to 60 ft. Tidal range $2\frac{1}{4}$ ft. Gravel, sand and coral bottom. Little shelter.

Landing Fields: These could be constructed on Ulul, Magur and Pissaras Islands. Ulul Island is long and low and lies in the direction of the prevailing winds.

Resources: Limited supplies of chickens and fish on Pissaras Island. Coconut and breadfruit trees grow on Magur Island and probably on Ulul.

Population: In 1935 there were 303 natives and 1 Japanese on the islands. They were distributed as follows: Pissaras 58; at Onari 64 (1 Japanese); at Ono 58; and at Ulul 126.

A white light has been sighted, distance 5 to 7 miles, bearing 197°. It might be serving as a beacon or as submarine bait.

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Pulap Islands - 7-38-21 N., 149-24-59 E. at Obs. spot Pulap Island. H.O. Chart 5425.

These islands consist of three low wooded islands: Pulap at the N., Tamatam on the S., and Fanadik on the W. of the atoll which is about 6 $\frac{3}{4}$ miles N.-S. and 3 $\frac{1}{4}$ miles E.-W. Observation in Jan. 1943 showed no military installations. Pulap, the largest island, is about 3 $\frac{1}{4}$ mile in NE.-SW. direction, hardly big enough for an air field. Tamatam is about 2800 yds. in length E.-W., but only a narrow sand strip in the central part.

Most of the surrounding reef is submerged to not less than 5 fathoms except near the islands. The reef extending SW. from Pulap Island dries for about 2 miles at low spring tides. In rough or cloudy weather the reefs on the E. and SW. of the atoll are difficult to see.

There are deep passes through the reef on the SW. side, with depths from 5-17 fathoms. N. of Fanadik Island there is passage 3 $\frac{1}{4}$ of a mile wide except for 3 fathom spot (see H.O. 5425). Passages are also reported on the S. side of Pulap Island. Landings can probably be made on the S. side of Pulap, with a strong westerly current.

Anchorage in 15 fathoms; sand bottom can be found about 1 mile S. of Pulap. NE. winds may render this unsafe. Other anchorages are on N. side of Tamatam and NW. of Fanadik in calm weather.

Landings can probably be made on the NW. coast of Tamatam Island on sandy beach. There is a native village reported on the NE. side of this part of the island. Study of photographs also indicate sandy beaches on E. and SW. sides of Pulap Island. Here the wide fringing reef and strong air currents may make approach difficult (Jan. 1943).

A population of 135 natives on Pulap and 104 on Tamatam Island was reported in 1935. Supplies are limited to coconuts and fish. Water supply is rain-water catchments.

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CAROLINES (Cont'd)

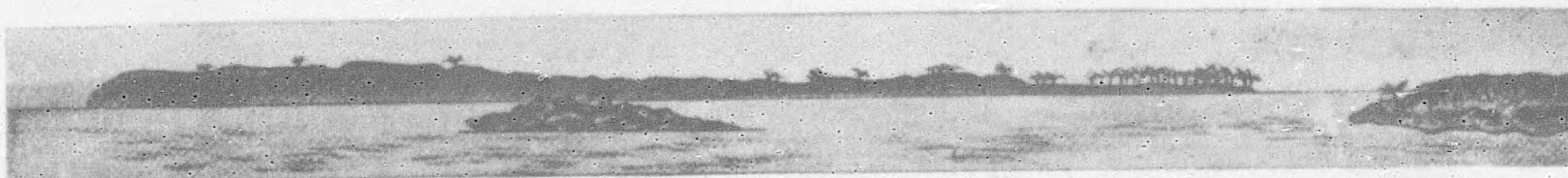
Puluwat Islands: 7-21-22 N., 149-11-35 E. Puluwat Islands Obs. spot. H.O. Chart 5425.

Consists of 5 low, closely-grouped islands with lagoon between the islands and fringing reef.

ENDERBY (PULUWAT) ISLANDS

Alet

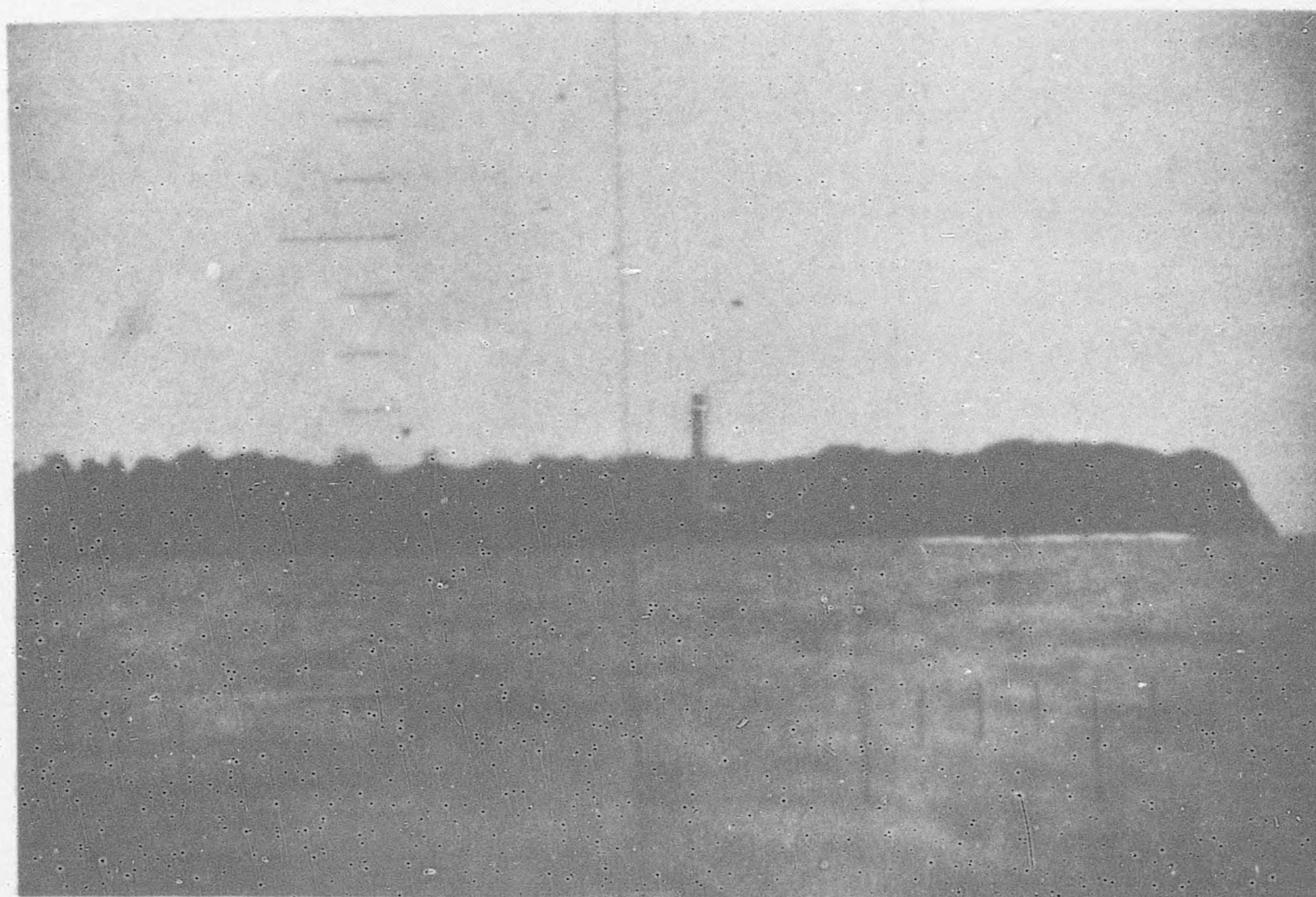
Puluwat:



30° 6.5 naut. mi.

Sau
 339° 6.5 naut. mi.

Alet on the NW. and Puluwat on the E. are the largest islands. The islands have considerable growth of coconut and breadfruit trees. There are shallow reefs between Puluwat and Sau Islands, but small boats can pass easily. At the NW. end of Alet Island there is a beacon light tower which is marked as 133 ft. high on H.O. Chart. (See Photo)



ALET ISLAND. Puluwat atoll (October 1943) shows lighthouse at NW. tip Alet island and probable wireless station just S. of the wireless light.

Anchorage: Anchorages can be found on the W. side of Puluwat and near N. part of Rewo. Sailing vessels anchor in front of Relong. S. of Sau Island on the outside there is anchorage (reported by the Japanese) in 14-18 meters over coral. This is unsafe in NE. monsoon season.

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Puluwat Islands (Cont'd)

Landings: An easy landing is reported on the sandy beach on W. shore of Puluwat. There is a wharf on the SE. of Alet Island which extends about 90 ft. into the lagoon. There is a small building at the shore end. At the W. end of Alet Island air reconnaissance shows a building about 30 by 40 ft. with a small tower at one end. This building which may house a power unit is one of a group of 4. SW. of the cleared areas a W/T station has been reported. Near the lighthouse on the W. tip is an enemy installation of 10 buildings (est. 20 by 40 ft.) See airphoto below.



West tip of ALET ISLAND. Buildings approx. 20 x 40 ft. east of light tower. Four buildings suggesting a wireless unit and power station are toward the beach S. of the light.

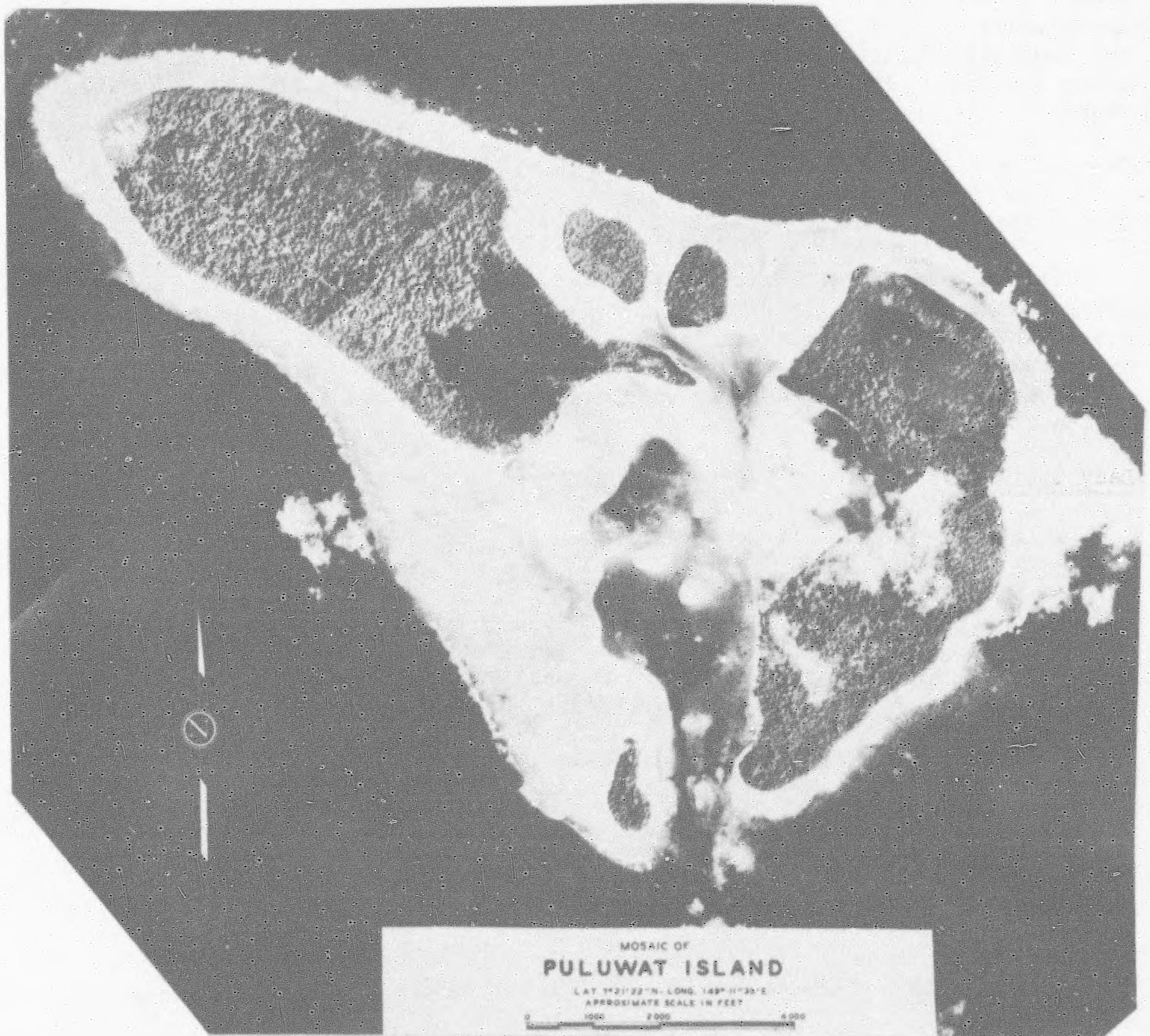
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Puluwat Islands (Cont'd)

Roads: A road runs from the lighthouse on the NW. of Alet Island to the pier on the SE. tip. A small road or trail continues to the E. On Puluwat Island the villages along the lagoon side are connected by a road. No fortifications are reported. Alet and Puluwat Islands have sufficient area for landing field but none observed or reported. The lagoon is well-sheltered but rather small for landing and take-off for seaplanes. It may be an emergency landing.



Japanese installations and light visible at northwest end of Alet Island, connected by road with pier visible at the southeast corner. January 1943.

Population: In 1935 there was a population of 335 natives reported, mostly on Puluwat

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Pulusuk Island: 6-42-15 N., 149-18-47 E. at Obs. Spot. H.O. Chart 5425.

A low coral island 1 3/4 miles in a N.-S. direction; 1/2 mile wide. Densely wooded. Fringing reef wider on W. side.

Landings: A landing place on the N. end of the island is shown on chart. A beach is also reported on the W. coast. A boat passage through the reef on the W. about 1500 yds. from the N. end is described as difficult to locate.

Anchorage: A good anchorage is indicated to the E.-NE. of the island in 5-8 fathoms. Pulusuk is at the SE. end of Manila Reef. Land for small air strip possible. Fresh water lake in N. section 2600 ft. by 1500 ft. Mostly swampy.

Population: 194 natives reported (1935).

Manila Reef: 7-05-00 N., 149-02-00 E. at N. end. H.O. 5417.

This submerged reef extends NW.-SE. for about 30 miles, Pulusuk Island being at the SE. end. It divides into N.-S. sections at about the center where the water is 273 fathoms (H.O. Chart 5417 Japanese source reports the shallowest point at NW.). Extremity being 1 1/2 - 2 3/4 fathoms, at other parts of the reef depths are reported over 5 1/2 fathoms with change in color of the sea over the reef.

Lady Elgin Bank: 6-18-00 N., 149-28-00 E.

A least depth of 4 fathoms reported. Breakers have been seen over the bank.

Helene Shoal: 5-30-00 N., 149-05-00 E. H.O. Chart 5417.

About 14 miles E.-W. direction. General depths of 5-19 fathoms with 2 shallowest spots near the ends of the shoal.

Saijo (Mogami) Bank: 8-33-00 N., 148-58-00 E. near center E. side. H.O. Chart 5417.

23 miles N.-S. and 27 miles E.-W. is a submerged atoll. Depths 6-20 fathoms on the rim, 18-20 fathoms inside. Separated from Gray Feather Bank on S. by deep water. Koyo Bank to the W. is small, with least depth of 7 1/2 fathoms.

Gray Feather Bank: 8-00-00 N., 149-00-00 E. at center E. side. H.O. Chart 5417.

About 42 miles N.-S.; about 35 miles E.-W. and in form of a submerged atoll. Depths, 8-20 fathoms on the rim and 21-38 fathoms inside.

Shin Matsuye Bank: 07-55 N., 148-20 E. H.O. Chart 5417.

Lies off the western end of Gray Feather Bank, which is 28 miles NW. of Puluwat Islands. Reef extends about 9 nautical miles from E. to W. and about 5 nautical miles from N. to S. It has depths of 8 to 22 fathoms.

Condor Bank: 07-28 N., 148-05 E. H.O. Chart 5417.

A coral bank 62 miles W. of Puluwat Islands. Has a least depth of 11 1/2 fathoms. Three shoals lie northwestward 4 to 12 1/2 miles.

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CAROLINES (Cont'd)

Condor Reef: 08-10 N., 147-50 E. H.O. Chart 5417.

Directly E. (4 nautical miles) of Pikelot Island. Measures about 23 miles in a E.-W. direction; with depths of 8 to 30 fathoms. Southern side of the reef, as well as a patch off the southeastern point known as Matsuye Bank, are well marked by the discoloration of the water.

Pikelot Island: 08-05-24 N., 147-38-06 E. at N. end. H.O. Chart 5425.

A single coral islet measuring about 400 yds. N-S., and about 300 yds. E.-W. It is surrounded by a reef, but has no lagoon. Landing is possible on the western side. Apparently no permanent inhabitants and no military value. There are shrubs and a few coconut palms. Turtles are abundant.

Tarang Reef: 07-47-00 N., 147-38-15 E. H.O. Chart 5417.

A small reef, marked by discoloration of water, with a depth of $8\frac{1}{2}$ fathoms. There is another reef, about $2\frac{1}{2}$ miles SE. of Tarang Reef, which has the same depth and extends $2\frac{3}{4}$ miles.

Oraitilipu Bank: 08-10 N., 147-15 E. (at N. end) H.O. Chart 5417.

Measures about $4\frac{1}{2}$ miles NW.-SE. and lies 21 miles W. of Pikelot Island. Water is blue over the area. Depths are from $8\frac{1}{2}$ (at SE. extremity) to 20 fathoms.

Satawal Island: 07-21 N., 147-02 E. at South Point, H.O. Chart 5426.

A sandy wooded island fringed by coral reefs, about 40 nautical miles E. of Lamotrek Islands. A shallow reef extends out into the sea 1,200 yds. eastward at the eastern end and 800 yds. southward from the southern end. Breakers are seen around the island in stormy weather. The island measures about $\frac{3}{4}$ mile long by $\frac{1}{3}$ mile wide. No anchorage is available near the island.

Landings: Landings can be made on the beach on the western side of the island, if the wind is from the NE. During SW. winds, the sea is high and landings difficult.

Resources: The island is well-covered with vegetation, with plentiful coconut trees, breadfruit and umbrella trees, taro and bananas.

Population: In 1935, there were 287 natives and 3 Japanese; all the houses are on the western side. Fleas and mosquitoes are numerous. While no military use of the island has been reported, the island may serve as an observation post. An airfield strip about 4,500 ft. long in the direction of the prevailing winds could be constructed, although the land is rough.

West Fayu Island: 08-05-17 N., 146-44-29 E. at S. point. H.O. Chart 5426.

A small (300 x 275 yds.) thickly wooded island with no permanent population and little military importance. It is surrounded by a shallow reef which projects as a solid finger about 1,200 yds. eastward from the eastern end of the island, and which curves S. and W. about 800 yds. from the southern end of the island to form a lagoon about 4 miles long and $1\frac{1}{2}$ miles wide. The only opening in the reef is on the lagoon's SE. side, and this 1,000 yd. opening is greatly restricted by shoal depths of 1 to $1\frac{1}{2}$ fathoms in the center of the passage. Only narrow channels of about 100 yds. and 250 yds. width with depths of $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms remain.

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West Fayu Island (Cont'd)

There are probably 12 or more 500-yd. berths in the lagoon, in 8 or more fathoms of water.

Anchorage: West Fayu may be a seaplane anchorage with limited facilities.

Boats can easily reach the landing place at the southern end of the island.

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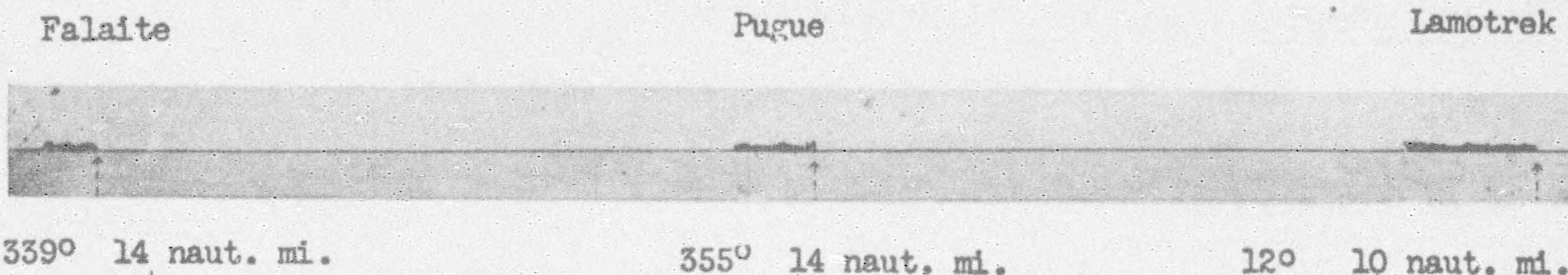
CAROLINES (Cont'd.)

Lamotrek Islands, 07-27-43 N., 146-23-22 E. at SE. end, H.O. Chart 5426:

These consist of three wooded islets on a triangular atoll 8 miles long NW.-SE. and $3\frac{1}{2}$ miles wide N.-S. enclosing a lagoon. There are coconut and breadfruit trees. The northern side of the reef is continuous, but the other sides are broken.

Entrances: The widest and best entrance is on the northeastern side, about three-quarters of a mile southward of Pугue Island, and with a least depth of $6\frac{1}{2}$ fathoms. When the NE. winds are strong, the 400-yd. passage in the middle of the southern side is a good channel, but difficult to find. Westward of this is a passage about 300 yds. wide. All the other entrances are narrow. The lagoon has an area of about 8 sq. miles, with depths of 10 to 20 fathoms.

LAMOTREK ISLAND



There are 3 islands, of which Lamotrek, 1,200 x 950 yds., is the main island.

Landings: Landings can be made on a sandy beach, free of reefs, on the lagoon side of this island.

Anchorage: Lamotrek has a large anchorage area suitable for all types of ships and for seaplanes. The best anchorage with shelter from NE. winds is off the western side of Lamotrek Island, but the sea becomes rather high during westerly winds.

Elato Islands, 07-30-40 N., 146-11-00 E. at N. end, H.O. Chart 5426:

Lying just westward of the Lamotrek Islands, the Elato Islands consist of 2 atolls. The northern atoll encloses 2 lagoons and is about 4 miles long. There are 4 islets on it, Elato, at the northern end, being the largest. This islet is about 800 x 400 yds., flat, sandy and wooded. The southern atoll encloses one lagoon and is about $1\frac{1}{2}$ miles long. The very small islets of Toas and Ulor here are wooded.

Entrances: The only good passage is on the eastern side of the northern atoll, about one mile southwestward of Elato Island. This entrance is about 100 yds. wide with depths of from 5 to 6 fathoms.

Anchorage: There is a small anchorage area about $\frac{1}{2}$ mile S. of the western extremity of Elato Island, with protection from NE. winds, and with a reported depth of 7 to 11 fathoms. Small boats can easily reach the sandy beach at the SW. side of this island.

If an air field were constructed on Elato Island, its maximum length would be 2,000 ft. There is a seaplane anchorage in the northern lagoon. Some facilities have been reported.

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Olimarao Islands, 07-41-50 N., 145-52-46 E. at S. end of Olimarao Islands, H.O. Chart 5426:

They consist of 2 flat islets, Olimarao and Falifil, on an atoll reef. The atoll, which is about 2-1/3 miles wide by 1 1/2 miles long, has a surrounding reef which is broken only on the S. side.

Entrances: There are 3 openings on this side but they all seem to be shoal. The lagoon has an area of about 1.8 sq. miles.

Landings: The reef surrounding Olimarao Islands makes landing difficult.

Resources: The island itself measures about 800 x 400 yds. at the N. end, and is covered with coconut palms and other trees. The lagoon offers an emergency seaplane anchorage.

Gaferut Island, 09-14 N., 145-23 E., H.O. Chart 5426:

A low, uninhabited island, completely encircled by a fringing reef, with no apparent military importance. The island measures about 600 x 275 yds., and while thickly covered with trees, is reported to have no coconut palms. Fresh water is unavailable.

There is anchorage off the southern end for small vessels in good weather. A passage for small boats is in the northwestern part of the reef.

Faraulep Islands, 08-35-45 N., 144-33-16 E. at Obs. Spot, H.O. Chart 5426:

Consisting of 3 wooded islets on an atoll, these islands provide a seaplane anchorage and have land area barely sufficient for a landing strip.

Faraulep Island is the largest, measuring about 700 yds. E.-W. by 350 yds. N.-S. There are three narrow channels on the southern side of the atoll, but they are suitable only for small vessels. The lagoon has charted depths of 8 to 11 fathoms. Population in 1935 consisted of 291 natives and one Japanese.

Tarang Bank, 08-22 N., 145-15 E., H.O. Chart 5417:

This bank is about 14 miles in extent and has a least depth of 14 fathoms. Change in the color of the water marks the shoalest place. Beside the main bank is a reef about a mile in circumference and with a least depth of 14 fathoms which was named Akashi Reef.

Earl Dalhousie Bank, 08-05 N., 144-55 E., H.O. Chart 5417:

Lies 13 miles SW. of Tarang Bank. It is 8 miles in extreme length, with a minimum depth of 14 fathoms. It is difficult to recognize it by the discoloration of the water.

Gamen Reef, 07-22 N., 144-33 E., H.O. Chart 5417:

This reef is circular in shape and about 200 yds. in diameter. The depths range from 2-3/4 to 14 fathoms. A seaplane anchorage is indicated.

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CAROLINES (Cont'd.)

Ifalik Islands - 07-14-57 N., 144-27-01 E. (Ifalik Island Obs. Spot)
 H.O. Chart 5426.

An emergency seaplane anchorage and a reported but unconfirmed landing field are located on this group, which consists of 3 wooded islands on an atoll reef enclosing a lagoon. The overall dimensions of the atoll are 2 1/8 by 1 5/8 miles. The lagoon is about a mile in diameter, with depths of 4 to 11 fathoms and a shoal patch just inside the entrance.

Entrances - Between the two islands on the southern side is a passage about 125 yds. wide with 4 fathoms in the entrance but only 1/4 to 2 1/4 fathoms just inside. It is possible, however, that the passage is narrower and deeper than charted, or that there is a considerable tidal range.

Anchorage - The lagoon has depths of 2 1/4 to 11 fathoms and probably provides clear anchorage for any craft able to enter.

Small vessels could possibly anchor outside the lagoon directly S. of the entrance about 400 yds. from the reef where there is a 25-fathom spot.

Uloa Reef - 07-01 N., 144-12 E. H.O. Chart 5418

This reef, 19 miles SW. of Ifalik Islands, is 1,420 yds. E.-W. by 820 yds. N.-S. It has a least depth of 10 fathoms over a coral bottom.

Woleai Islands - 07-22-19 N., 143-54-20 E. at Woleai Island Obs. Spot.
 H.O. Chart 5426.

This atoll, about 6 miles long, E.-W. and about 15 miles in circumference, is divided into E. and W. lagoons which are open on their S. sides. The reef forms an almost continuous land rim on the E. and N. sides. There are about 20 small islands and islets, Woleai and Raur being the largest on the eastern side. At the southwestern end, the islands of Pial, Komol and Falulap are reported to have been washed away.

Anchorage - The East Lagoon, which contains the main anchorage, has a surface area of about 1.6 sq. miles with depths of 3 to 21 fathoms. Good protection is afforded from easterly and northerly winds, but none from the SW. However, the NE. trades may bring powerful seas into the lagoon at times with heavy breakers on the shoals in the north central part.

The West Lagoon is completely exposed to the SE., and is incompletely charted.

There are three entrances into East Lagoon, Raur Channel probably being most used, and four into West Lagoon. The passage NW. of Motegosu, connecting East and West Lagoons, is probably the best channel for deep draft vessels going into West Lagoon. (See O.N.I. #31, pp. 106-7). Anchorage can be obtained for large vessels in East Lagoon about 900 yds. W. of the northern part of Raur Island, in depths of from 15 to 20 fathoms. The shallow entrance to West Lagoon hinders the entrance of large-sized vessels, and swells enter during SW. winds. Good anchorage in SW. winds is afforded in the open sea on the N. side of Tagaulap Island.

Woleai, Raur, Paliau and Mariaon Islands, around the East Lagoon, are well-wooded, but with clearings, sheds and low buildings visible, especially

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Woleai Islands (Cont'd.)

on the lagoon side. A causeway or bridge connects Woleai and Paliau Islands. The islands are fortified. See Sections 602, 603-200, 300.

Eauripik Islands - 06-41-12 N., 143-04-07 E. at Eauripik Island Obs. Spot. H.O. Chart 5426.

The atoll includes 6 islets, and is $5\frac{1}{2}$ miles long and $1\frac{1}{2}$ miles wide. The largest island is 750 x 250 yds. and is tree-covered. Maximum height of tree-tops is 102 ft. The lagoon is long and narrow, $3\frac{1}{2}$ miles E.-W. by $\frac{1}{2}$ mile N.-S. and has an area of about $1\frac{1}{2}$ sq. miles. There are two shoal spots in the lagoon and others may exist. A seaplane anchorage is feasible here.

EAURIPIK ISLAND

Qao Is.

Eauripik Is. Siteng Is.



315°

331°

338°

Entrances - The reef has no breaks. It is reported that boats can cross the reef at high water. Depth of water offshore is more than 108 fathoms.

Anchorages - There are no known ship anchorages, inside or outside the lagoon. There is a jetty on the S. shore of Eauripik Island which small boats are able to reach at high tide.

Resources - There are meager supplies of coconuts and fish. Rainwater is probably available in cisterns.

Population - In 1935, the population consisted of 110 natives. In an observation in June 1943, a very few habitations of a primitive sort were seen.

Fais Island - 09-45-26 N., 140-31-07 E. at S. coast of island. H.O. Chart 5426.

A single island, with no lagoon and mostly fringed by reefs. The N. end of the island is about 40 ft. in elevation and the NE. end has a cliff 42 ft. high. The middle of the island is cultivated and from 60 to 65 ft. high. The elevations may be as high as 107 ft. There is potential landing field area. The island is roughly oval in shape with a length of $1\frac{1}{2}$ miles. Vegetation (especially coconut palms) is abundant.

Anchorages - The dangers around Fais are said to be all within $\frac{1}{4}$ mile of the shore. Anchorages have been reported:

1. SW. end of the island in 19 fathoms. Little protection here from NE. trade winds.
2. On S. side.
3. On E. side in 23 fathoms.

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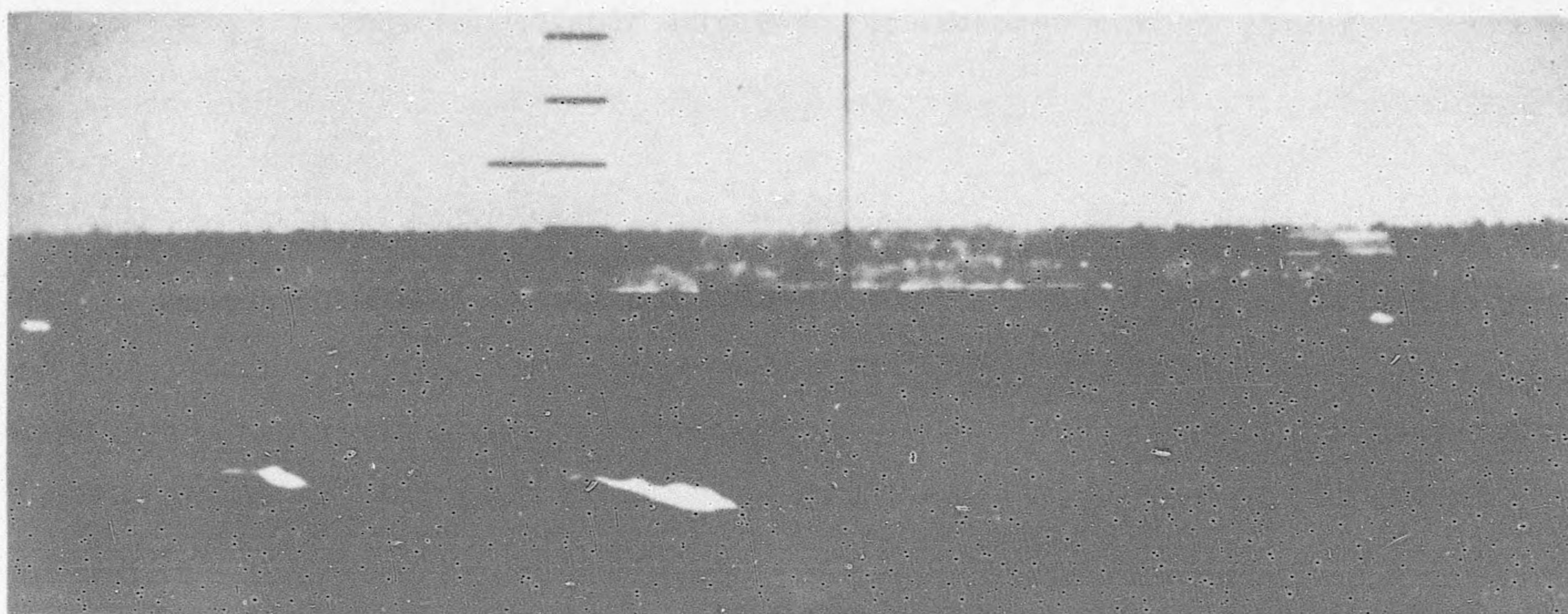
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CAROLINES (Cont'd.)
Fais Island (Cont'd.)

4. At NE. point in 6 fathoms. None of these are said to be good, and all must be made fairly close in. There is a mooring buoy, with flashing lights, off the middle of the NW. side of the island.

Landings - Landing, though difficult, can be made on the sandy beach on the SW. side when NE. winds are blowing. There is less surf here.

Resources - Important phosphate works, a refinery and warehouses and a naval radio station are located on the island.



FAIS ISLAND. App. Lat. 9°45' N. Long 140°30' E. Refinery and the large warehouse adjacent to the phosphorite works.

Sorol Islands - 08-08-00 N., 140-24-30 E. at Sorol Island Obs. Spot.
 H.O. Chart 5426.

This atoll, measuring $6\frac{1}{2}$ miles long and $1\frac{1}{2}$ miles wide, has 17 low, thickly-wooded islets and a lagoon nearly 3 miles long and about a mile wide. There is an emergency anchorage here. Sorol Island is the largest island, being about $1\frac{3}{4}$ miles by 75 to 400 yds. wide. Reported landing strip, unconfirmed.



Western end of Sorol Island, Sorol Atoll
 Bearing of Island 146°T. To 151°T. Range of island 3000 yds.

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CAROLINES (Cont'd.)
Sorol Islands (Cont'd.)

Entrances - The lagoon's southern side is submerged at high tide. The only entrance, so shallow that only small boats can pass, is through the middle of the SW. side of the reef.

Although the chart shows a 7-fathom patch about $3\frac{1}{2}$ miles SE. of Sorol Island, the Japanese have reported a 650-yd.-wide reef about 5 miles SE. of Sorol Island.

Anchorages - There are no available anchorages for ships. At high tide and in calm weather, boats can land in front of the village on Sorol Island. Also, it is sometimes possible to land on the SW. tip of the island during high tide by coming between Sorol and Bigelor Islands.



North side of Bigelimol Island, Sorol Atoll
 Bearing of Island 173° T. to 187° T. Range of
 island 2000 yds.

Ulithi Islands - 10-05-30 N., 139-43-15 E. (East side of Mogmog.) H.O. Chart 5426.

A very large atoll with a seaplane anchorage, potential landing fields, and a good ship anchorage. The group can be divided into 4 sections, the main one being an atoll 19 miles long by $9\frac{1}{2}$ miles at the widest part. The remaining 3 are: Falalop Island, E. of the main atoll; a small detached reef with 4 small islands on it, and Zohhoiioru Bank. (See O.N.I. #31, pp. 100-101).

The main atoll has a lagoon area of about 85 sq. miles. The lagoon is incompletely charted, but in general, depths appear to be from 10 to 23 fathoms.

Entrances and Anchorages - There are a number of passages. Probably the best one lies about a mile NE. of Magejang Island, with depths of over $5\frac{1}{2}$ fathoms and no dangers and leading into the best anchorage area in the NE. section of the lagoon.

Landings - Since all the islets are fringed by reefs, it is difficult for anything larger than rowboats to land. At high tide, small boats can land on the western part of Asor Island and at the northern end of Fassarai Island.

Hunter Bank - 09-57 N., 138-16 E. H.O. Chart 5418.

This small bank lies 20 miles N. of Yap Island and 78 miles W. of Ulithi Islands. It is about 1 mile in extent, with a minimum depth of 12 fathoms.

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CAROLINES (Cont'd.)

Yap Island - 09-30-30 N., 138-08-17 E. at Tomil Harbor Obs. Spot. H.O. Chart 5421.

A compact land area, partly subsided beneath the sea, consisting of 4 large and about 10 small islands set within a wide fringing reef. It has a seaplane anchorage, airfield, communications (cable and radio) station, and is an operational base for light vessels.



Looking NE. across Tomil Harbor toward Tomil Island.

Nearly triangular in shape, it measures 14 nautical miles along the SW. side, $8\frac{1}{2}$ along the E. side, and $16\frac{1}{2}$ along the NW. side. The largest island of the group is Yap, or Western Island, forming the southwestern land area. The southern part is low, marshy, and covered with thick brush. The northern part is higher with a N.-S. ridge of a general 500-ft. elevation paralleling the harbor. There are three main islands forming the northeastern half of Yap: Rumung, Map and Gagil-Tomil (Eastern). These islands have a general elevation of 100 ft., running to small ridges and peaks, 200 to 300 ft. in elevation.

The principal zone of cultivation is along the coastal area, but deep, black soil is found inland as well. There are many coconut palms.

Entrances - There are six entrances through the reef, of which the entrance to Tomil Harbor is best. All are narrow.

1. Tomil Harbor is about 3 miles long, and varies in width from 200-500 yds. However, coral reefs narrow the channel entrance to about 100 yds. It is best to enter and leave by daylight, with a man aloft to spot the reefs and channel by the color of the water. The harbor in general has depths of 12- to 20 fathoms.
2. Gofenu Entrance, on the NE. coast, leads to a reef-enclosed basin which is $1\frac{1}{3} \times 1\frac{1}{3}$ miles. This basin is poorly surveyed. It is connected to Tomil Harbor by Tageren Canal, which is suitable for small boats at high tide.
3. Mil Entrance, on the NW. coast, is less than 50 yds. wide. There is a well-protected but incompletely surveyed harbor here, $2\frac{1}{2}$ miles long. The Tageren Canal also connects it to Tomil Harbor.
4. There are 3 other charted entrances, but these are not known to be used by shipping.

Anchorage - In Tomil Harbor there is room for two 400-yd. and ten 300-yd. berths, but very little swinging room is left. High land to northward and westward, and hills to the E. of the northern part provide good protection for the anchorage, although there is no wind protection from the S. or SE. There are anchoring depths of 10 to 23 fathoms. Several branches of Tomil Harbor are believed suitable for many seaplane anchorages, although too small for ships.

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CAROLINES (Cont'd.)
Yap Island (Cont'd.)

YAP ISLAND

69 Meter Hill

177 Meter Hill

Mt. Matade

32 Meter Hill

Indicated by triangle



25° 11' Nauf. mi.

37° 15' Nauf. mi.

Landings - Shallow draft boats might make landings directly on the shore at high tide over the reef. Gatjug and Nimpol Entrances provide access to reefs close to the shore. There is an estuary with an entrance 3/4 mile S. of Tomil Harbor which gives direct access to the shore. Landings could be made by entering Tomil Harbor or the basins inside Mil, Gofenu and Pelak Entrances, but probable defenses, especially at Tomil Harbor, would have to be taken into account.

See Sect. 602; 603-150, 200, 300.

Ngulu Islands - 08-17-50 N., 137-29-20 E. at S. end. H.O. Chart 5426.

These consist of several islets on an atoll reef, enclosing a large lagoon. A seaplane anchorage just N. of Ngulu Island and an airfield on the island have been reported without confirmation. Anchorage area for large ships exists but there is little protection from sea or wind. The atoll is 19 miles long. Ngulu, the largest island, is circular, about 500 yds. across, and inhabited. It is densely covered with coconut trees.

The chain of reefs on the eastern side of the atoll are submerged so that with strong easterly winds there is a heavy sea in the lagoon. Large and small banks lie in the vicinity of the main reef. There is generally heavy surf on both sides of the reef, and the lagoon is frequently rougher than outside.

Entrances - There are channels on either side of Ngulu Island, that on the W. side being about 550 yds. wide and free of dangers, but that on the E. side is encumbered with shoals.

Anchorage - Can be obtained on northern side of Ngulu Island. It is reported to be generally smooth and good.

Landings - At high water a landing can be made on the N. side of Ngulu Island.

Supplies - Fish, shellfish and tortoises are plentiful. There are numerous sharks in the lagoon. Rainwater is collected for drinking.

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PALAU ISLANDS (PARAO)

Soundings in fathoms - Heights in feet

LIGHTS
F. fixed, Fl. flashing, Occ. occulting, Alt. alternating, Gp. group
R. red, W. white, G. green, B. blue, sec. color, (U) unwatched
Alternating lights are red and white unless otherwise indicated
Lights are white unless colors are stated

BOUYS

	red
	black
	with vertical stripes
	with horizontal stripes
	whistling
	ball
	lighted
	mooring

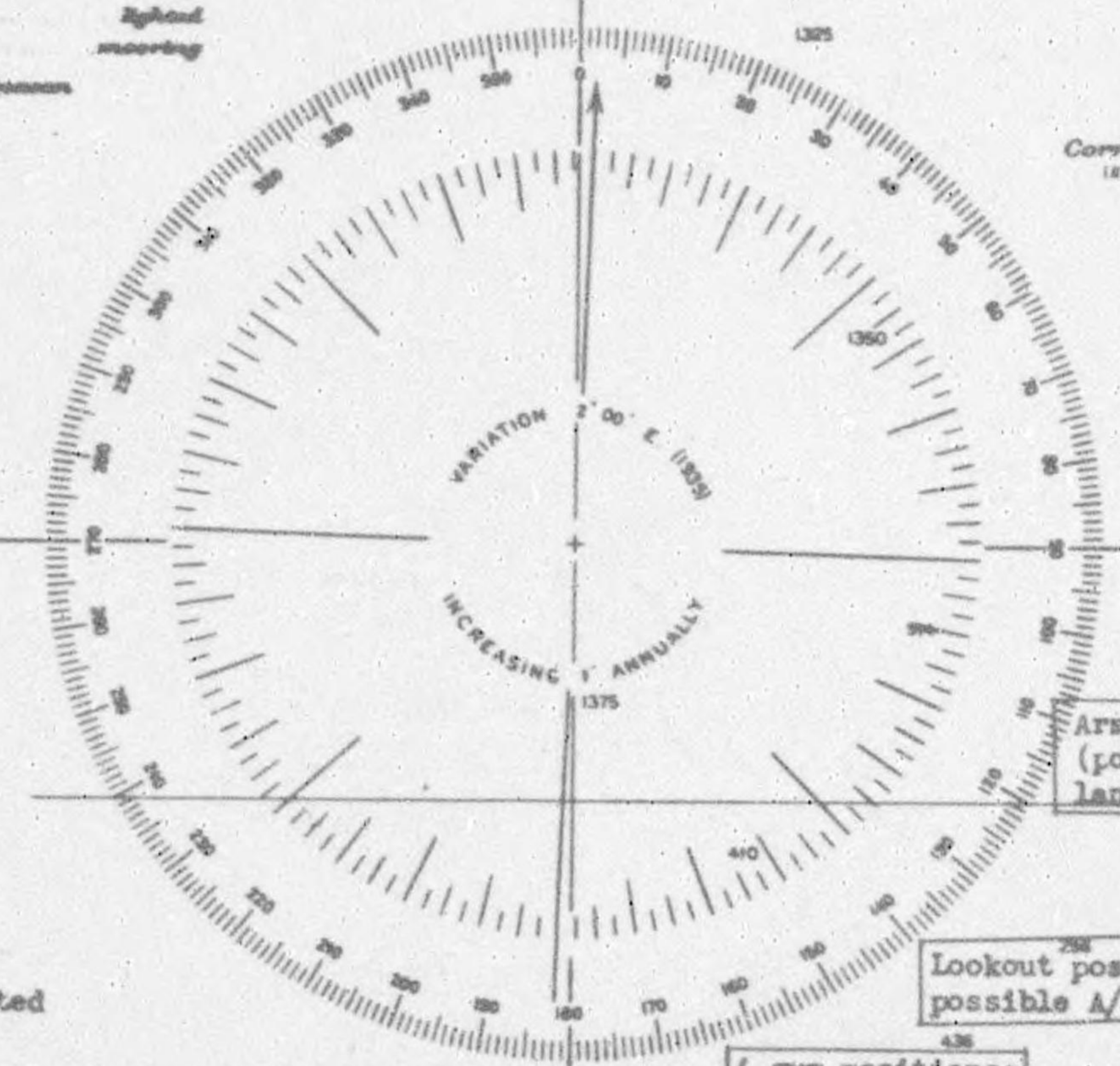
NOTE

Japanese names are shown in parentheses

JAPANESE AND ENGLISH TERMS

Hana	cape, headland
Ko	harbor, bay
Saki or keku	point
San	hill, mountain
Sho	reef
Suido	channel
To	island
Shoto	group of islands
Hakuchi	anchorage

6" guns } reported
 Heavy coastal guns }



Main passage through western reef
Lighthouse
Shipping route
Seaplane and submarine base

Lookout post; possible A/A
4 gun positions; reported 4.7"

Army Post (possible barracks; landings practiced)

Jetties reported

Anchorage believed suitable for large vessels

Approximate sites of Aluminum Refinery (a) and mine (b)

Jetty with beach on south side

Lake much smaller than charted

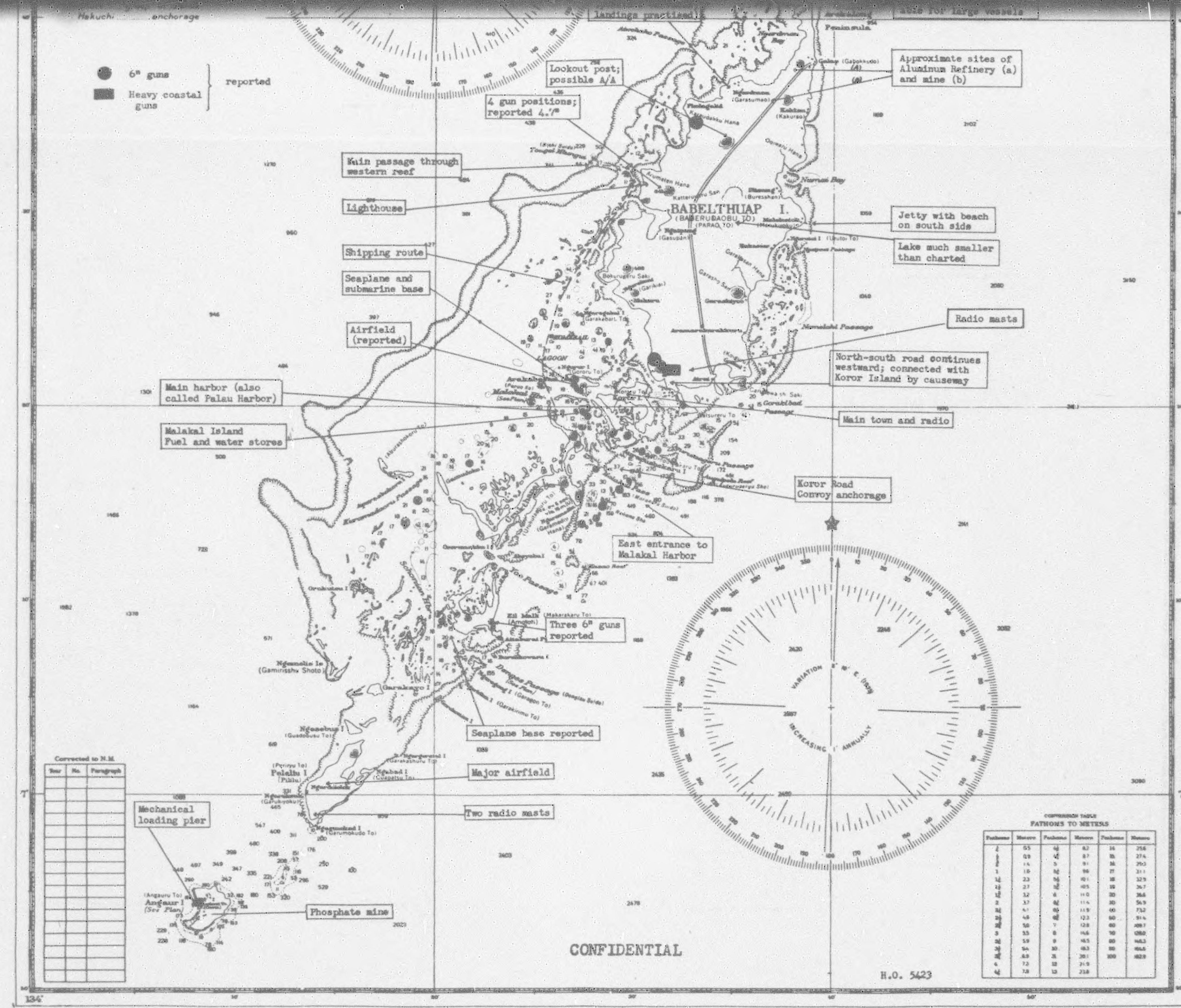
Kossol and Kawasak Passage suitable for large vessels; improved by blasting

Lagoon area south of Kawasak Passage reported possible DD, SS and S/P base

Passage for small vessels

Seaplane base reported

- 60/131 -



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H.O. 5423

- 60/132 -

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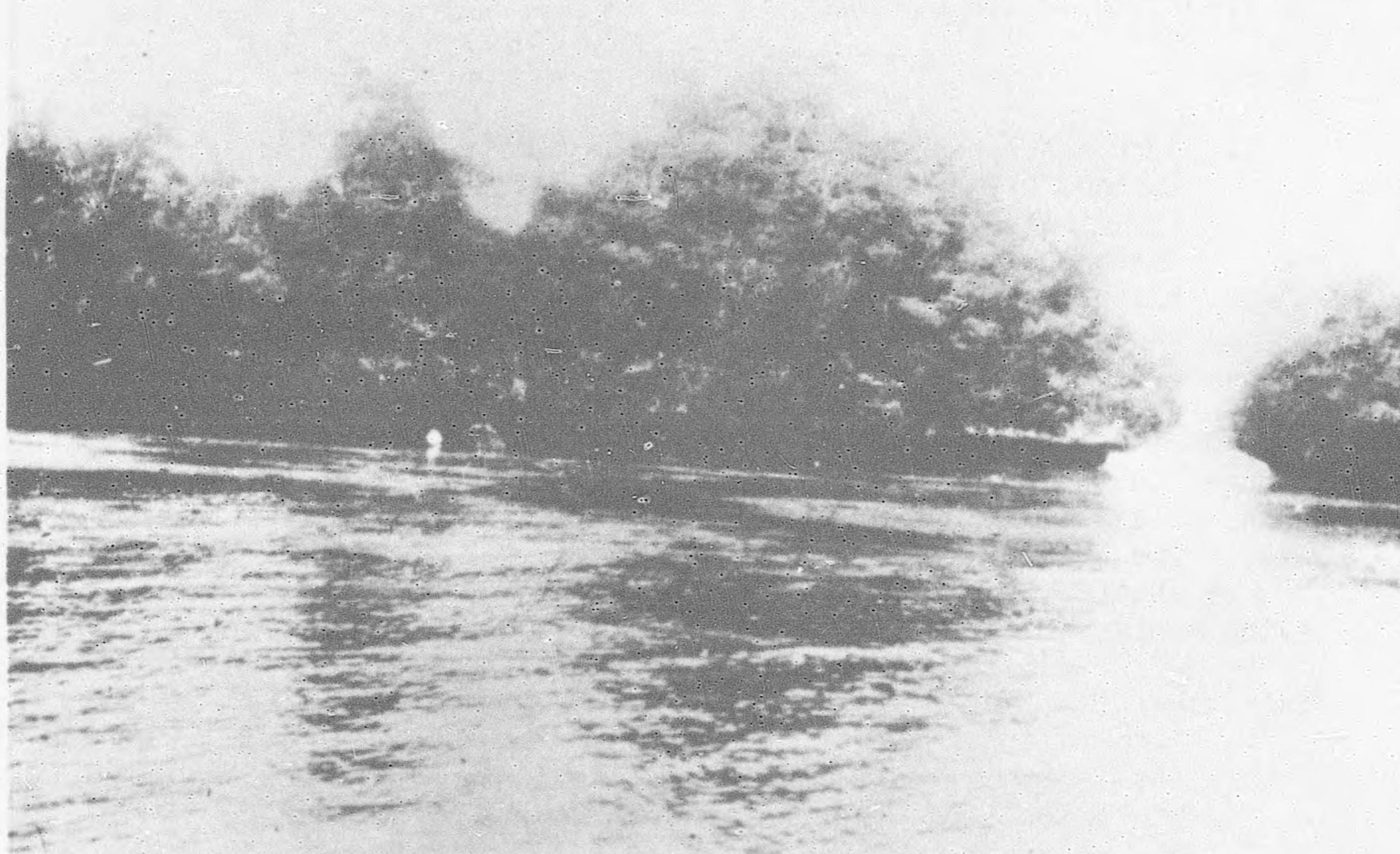
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CAROLINES (Cont'd.)

Palau Islands, 06-53-00 N., 134-07-30 E., 134-43-30 E.:

These islands are situated at the western end of the Carolines and a part of the islands appear to be of volcanic origin as they are lava and covered with red earth; Babelthuap, Arakabesan and Malakal are examples. Others are all coral reefs and limestone and generally flat, as Peleliu and Angaur. But other limestone islands are long and narrow hills, separated or connected, of considerable differences in height and with steep slopes toward the sea. Erosive action on the limestone form valleys, narrow inlets, passages and islets. Edges of the hills are cut inward by the sea and stalactite grottos are formed in many places. The islands are covered with vegetation including ironwood and ebony.



Palau Islands, showing edges of hills cut inward by the sea.

At the northern end of the group are several offlying detached reefs; the eastern side is largely fringed by reef; the western side is flanked by about 50 miles of barrier reef which at some points lies 10 miles W. of the nearest land.

The coastal waters, including entrances and anchorages surrounding the Palau Islands may be summarized as follows, proceeding in a N.-S. direction. (See Chart).

- a. Kayangel Islets: A passage for small vessels can be found on the W. side of the atoll and for boats on the S. side. A westward drift of one knot was reported once by a ship passing the W. passage.
- b. Kossol Passage: It is a 40-square-mile area at the northern end of the Palau Islands in which depths range from $5\frac{1}{2}$ to 27 fathoms. Practically no protection from winds is available, but the seas are mostly broken up by the reefs which surround the area except for three wide openings to seaward.

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CAROLINES (Cont'd.)
Palau Islands (Cont'd.)
Kossol Passage (Cont'd.)

These are all wide and deep and are on the E., N. and NW. sides. A fourth opening, Kawasak Passage (see below) leads to the Western Lagoon. It has been reported that coral heads in Kossol Passage have been blasted and that it has been used by large units of the Japanese Fleet.

- c. Namai Bay: The bay is a small, shallow roadstead at about the middle of the eastern shore of Babelthuap Island. It is open to the E. and has little importance.
- d. Airai Lagoon: The lagoon is NE. of Arangel Channel and E. of southern Babelthuap Island. The area is about 4 square miles but there are many reefs which are little known and navigation through them is difficult. It is doubtful whether the lagoon would be useful for anything but small craft and possibly seaplanes. The off-lying reefs are not high enough to break the swells accompanying NE. winds.

Entrances:

- 1. Namelaki Passage: This is in the middle of the eastern reef and has not been thoroughly examined. It is believed unusable during NE. winds due to the surf but is reported the best of the three entrances.
 - 2. Ngatpaet Passage: It is at the N. end, has about $3\frac{1}{2}$ fathoms and can be used by small boats in fine weather.
 - 3. Southern Entrance: It is about 800 yds. wide and 17 fathoms deep. The entrance is inside and N. of Goraklbad Passage.
- e. Arangel Channel: This body of water is NE. of Koror Road between Babelthuap Island and Augulpelu Reef. It extends as far N. as Goraklbad Passage. The area is about $6\frac{1}{2}$ sq. mi. in this lagoon. There are said to be few shoals. During NE. winds the channel is not tenable as the off-lying reefs are not high enough to keep out the swell.

Entrances:

- 1. Goraklbad Passage: It is a $2\frac{1}{2}$ -mile wide opening leading to the sea. Depths range from 6 to 23 fathoms. There are two shoal spots of $3\frac{1}{2}$ and $4\frac{1}{2}$ fathoms which can be avoided easily.
 - 2. Ogurutaageru Passage: This leads to Koror Harbor (see below).
 - 3. SW. opening to Koror Road: This appears navigable with depths of 14 fathoms or more between the shoals.
- f. Komebail Lagoon: This is part of the Western Lagoon NW. of Koror Island. Depths range from 7 to 24 fathoms with a few shoal spots. It is sheltered from NE. winds.
- g. Koror Harbor: This is a small body of water N. of Koror Island. There is only about one sq. mi. of water surface. Depths range from 12-17 fathoms. Good protection is available from all directions. A project for the expansion and repair of Malakal-Koror Harbor was started in 1939. It was to cost ¥ 2,765,561 (about \$650,000) and was to be completed in 1942.

Entrances:

- 1. Ogurutaageru Passage (Toagel Mid): This channel is about $4\frac{1}{2}$ mi. long and has fairway depths of 10 or more fathoms but in places is restricted by shoals to a width of little over 100 yds. These shoals could easily be removed by blasting. The channel is said

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Palau Islands (Cont'd.)
Koror Harbor (Cont'd.)
Ogurutaageru Passage (Cont'd.)

to be dangerous to use without local knowledge on account of the coral patches. Beacons 16-18 and O-P are in Koror Harbor.

Ogurutaageru Passage is reported connected to Iwayama Bay (S. of Koror Island) by means of a 60 to 70-ft.- wide channel through the narrow Koror Peninsula just SE. of Ngarmid Village. The existence of the passage is doubtful. In December, 1940, ships were forbidden to anchor in Ogurutaageru Straits, the channel between Babelthuap and Koror Islands.

2. The western entrance to Koror Harbor: This opens into Komebail Lagoon which is part of the large Western Lagoon (see below). Thence, it is probable that passage can be found between the shoals to one of the openings in the western reef. When entering or leaving Koror Anchorage, Japanese vessels have used Toagel Mlungui Passage.

- h. Station Harbor: This is a small, irregularly-shaped body of water off the SE. side of Arakabesan Island. The southeastern part has many reefs except for a boat passage, 100 yds. wide or less, and about 4 fathoms deep, which runs past the piers at Madalai and Ngarbaged.

The middle part of the harbor is well sheltered but small and restricted by reefs. There is a boat passage from here to Malakal Harbor (see Malakal Harbor).

The western part of the harbor is really an eastern extension of the big Western Lagoon of the Palau Group. It is a triangular-shaped body of water with an area of about $3/4$ sq. mi. and depths of 5-20 fathoms. Entrance can be made from Malakal Harbor by rounding the W. end of Ngar-gol Island or via the passes and channels in the Western Lagoon.

Western Lagoon: This is the water body between the islands' western shores and the off-lying western reef. It extends from Kawasak Passage on the N. to Schonian Harbor on the S., a distance of nearly 50 miles. There are probably 150 sq. miles of water surface in this area much of which is restricted by reefs and shoals.

The portion of the lagoon between Yoo Passage, Schonian Harbor and Aurapushekaru Island is said to be navigable with great care. Between Aurapushekaru Island and the W. entrance to Malakal Harbor, the lagoon is reported to be practically clear of danger.

From the W. entrance of Malakal Harbor to the passes on the NW. side of the reef as far as Kawasak Passage there is a precarious and devious, deep route through the lagoon but there are many reefs and shoals to be avoided. As none of these are marked, good light and careful navigation is necessary. In taking this route the following is advised: Pass on either side of Ngurur Island, thence steer about 5° to pass W. of Ngare-gabal Island. When abreast of Ngaregabai Island steer 348° for about 2 miles until the passage between the reefs opens out to the N., then steer about 30° , following the passage to abreast of Toagel Mlungui (and beyond, to the other passes). When plotted, these directions fail to agree in all respects with the H.O. Chart, which is inaccurate in this area.

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 Palau Islands (Cont'd.)
Station Harbor (Cont'd.)

1. Aiwokako Passage: Many rocks are reported in this pass.
 2. Denges Passage, thence through Schonian Harbor to the lagoon. (See Schonian Harbor).
 3. Kawasak Passage: This is reported to be the best of the northwestern reef passes. It is at the northern end of the lagoon and leads into Kossol Passage. It is advisable to make this pass from the E. because of the reefs to the N. and W. Its width is over a mile but there is considerable restriction by shoals. There are 10 fathoms or more in the fairway. A good and safe channel is reported from this pass along the W. coast of Babelthuap Island to Malakal Harbor but good light and careful navigation are required as there are many shoals to be avoided and this area is inaccurately surveyed.
 4. Malakal Passage, thence through Malakal Harbor (see Malakal Harbor).
 5. Ngamegei Passage: This appears to be largely blocked by reefs.
 6. Ngell Channel, thence through Malakal Harbor (see Koror Harbor).
 7. Ogurutaageru Passage, thence through Koror Harbor (see Koror Harbor).
 8. Toagel Mlungui: This is reported to be an excellent channel. There are no navigation aids but German Sailing Directions recommend keeping Mt. Gatiroir bearing 107°. This is probably the unnamed peak (641 ft. high) N. of Ngatpang Village although the chart does not agree exactly with these directions.
 9. Yoo Passage: Between Eil Malk and Urukthapel Islands, this passage is reported clear in the pass which can be made on either side of Abeyabu Island. Inside, there is a precarious route to Aurapushekaru Island.
- i. Malakal Harbor: It is small but completely protected from all seas and largely protected from winds. There are many shoals in the eastern part, but the western section has a very clear area with depths of 5½ to 23 fathoms.

Entrances: There are 4 openings into the harbor one of which can be used by small boats.

- Malakal Passage: This leads from Koror Road to Malakal Harbor. It is narrow and tortuous. The Japanese chart (No. 2106) indicates a least depth of about 30 ft. between buoys 16 and 18. The narrowest part between the bounding reefs is about 140 yds. but there are many protruding shoals which restrict the available 30-ft. channel to a least width of less than 100 yds. It is believed that the Japanese have done some blasting and dredging to improve it.

The channel is marked by beacons. The port hand on entering has black beacons surmounted by baskets and bearing odd numbers beginning with No. 1 from seaward. The starboard hand has red beacons surmounted by conical topmarks and having even numbers beginning with No. 4 (No. 2 is a red buoy lying 1.4 miles 159° from No. 2 beacon and marking a 4½-fathom spot in Koror Road). These beacons extend into the eastern end of Malakal Harbor, marking shoals there, the last numbers being 31 and 32. Nos. 17, 22 and 25 are buoys.

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Palau Islands (Cont'd.)
Malakal Harbor (Cont'd.)
Malakal Passage (Cont'd.)

The tidal current ebbs at the rate of about 2 knots per hour; floods at $1\frac{1}{2}$ to $2\frac{1}{2}$ knots per hour. The greatest velocity in both cases occurs between beacons 1 and 3. It is recommended that the passage be used only under favorable light conditions.

2. Ngell Channel: This also leads from Koror Road to Malakal Harbor. Its entrance is about $1\frac{1}{2}$ miles NE. of the entrance to Malakal Passage. The Japanese chart (No. 2106) shows a least depth of about $5\frac{1}{2}$ fathoms in the channel except at the entrance where there is a bar a little over 4 fathoms. The width and length of the channel appears to be about the same as that in Malakal Passage.
 3. West Entrance: This is a passage about 630 yds. wide and 14 fathoms deep between the northwestern tip of Urukthapel Island and the western end of Ngargol Island. It leads from Malakal Harbor to the lagoon to the W. and then to the sea by way of the narrow, tortuous and deep channels between the reefs (see Kmebail Lagoon).
 4. Channel on Aurapushekaru Island: This charted channel is one for small craft going from Malakal Harbor to Station Harbor. It is about 185 yds. long. Flood current sets N. in the passage about 2 hrs. after low spring tide; the weakest current sets S. during neap tides. Motor boats have little difficulty in going through. The channel has taken the place of the boat passage to Station Harbor which follows.
 5. Boat Passage to Station Harbor: The course of this passage leads between Aurapushekaru and Ngargol Islands; all the small, high islands are passed to westward. This was the lighter route in 1936 from Madalai wharf.
- j. Koror Road: This is an almost open roadstead off the entrance to Malakal Harbor. It is protected from the W. and N. by the islands of Urukthapel, Aurapushekaru, Koror and Babelthuap. There is some protection afforded by Augulpelu Reef from NE. seas but not from the winds. There is no protection from the S. and very little from the SW. There are several shoals in an uneven row near its outer edge; two of them have buoys. The shelf drops off suddenly just outside these shoals, the 100-fathom curve being almost $\frac{1}{4}$ mile to seaward.

Entrances: Approach is made from the NE. on about 250° two miles clear of the southeastern side of Augulpelu Reef which is easily distinguished by continuous breakers. Round Black Rock beacon, about one mile off and steer for No. 2 Buoy. Leave the latter to starboard and head up for entrance. When coming from the S., the islands of Ngargersiul, Gorokottan, Ngarklim, Ngeregong and Buruokowaru make good landmarks. Leave Kasao Reef well to port and head up for No. 2 Buoy. Passages for vessels up to 5,000 tons have been blasted.

Reef: In November, 1926, the Taikai Maru touched bottom $1\frac{1}{2}$ miles S. of Palau lighthouse (eastern Urukthapel Island). The report of the Koshu in July, 1931, stated that the reef at a minimum depth of 5 meters was 2,610 meters from the lighthouse on $173\frac{1}{2}^{\circ}$ bearing. The water depths in the vicinity were also reported as about 7 meters.

- k. Schonian Harbor: This is near the southern end of the main group of islands, SW. of Eil Malk Island. It has an area of about $3\frac{1}{2}$ sq. mi. Depths range from 7 to 22 fathoms. There are a few shoal spots in the

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 Palau Islands (Cont'd.)
Schonian Harbor (Cont'd.)

eastern and southern parts but the remainder appears clear.

Entrances:

1. Denges Passage: This leads from the sea through the eastern reef to Schonian Harbor. It is about 800 yds. wide at the entrance, but narrows to about 140 yds. at a point where there is a sharp turn to the N. The red beacon at this turning point and another about 400 yds. NNW. are not on the Japanese chart. Depths in fairway off this passage are from 7 to 19 fathoms with the exception of 2 spots with 3-3/4 fathoms which probably could be easily blasted out and may have been.
2. Western Entrance: It can probably be used by following the line of soundings shown on the Japanese chart (No. 2136). This heads between the reefs in the Western Lagoon and thence through Yoo Passage, Malakal Harbor and Malakal Passage, or the passages to the NE.

Anchorage:

a. Kayangel Islets:

1. There is shelter from E. winds for small boats in the lagoon.
2. An anchorage just S. of the atoll is reported.

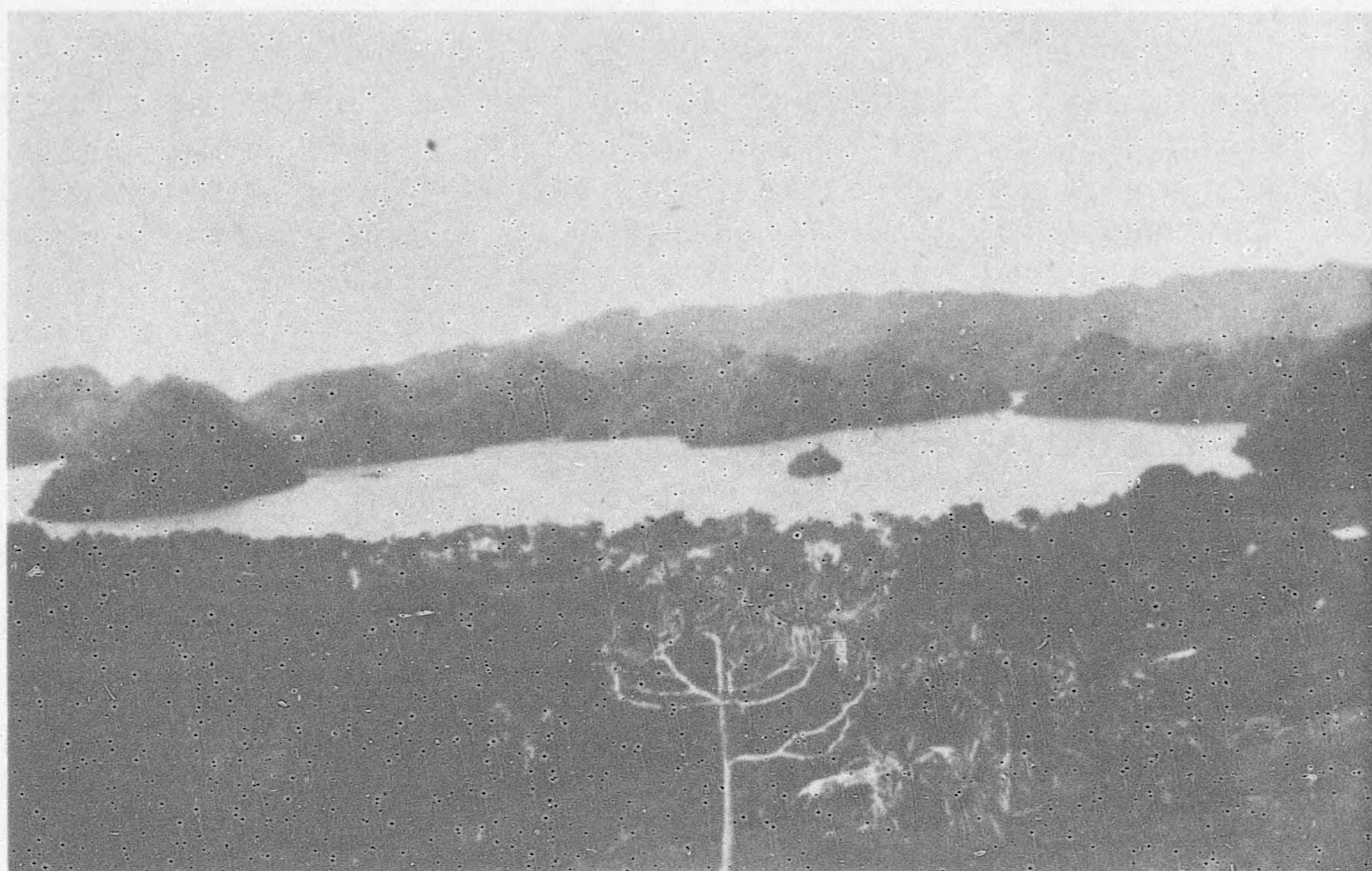
- b. Kossol Passage: A large number of vessels could find good anchorage there on a sand and coral bottom. It is believed that the Japanese are using or contemplating the use of this area as a submarine and seaplane base. It is possible that dredging has improved the passage for navigation and anchorage purposes. In 1929 the Second Japanese Fleet anchored in this passage.
- c. Airai Lagoon: It is doubtful whether this lagoon, in its present condition, would be fit for use by anything but very small craft and possibly seaplanes. Anchorage of any sort would be precarious in NE. winds as the off-lying reefs are not high enough to break the swell. A British vessel sailed through the lagoon and anchored off the villages of Enkassar and Melekeiok.
- d. Arangel Channel: A large number of vessels of all types could find anchorage here, probably as many as fifty 500-yd. berths. However, in NE. winds it is not tenable as the off-lying reefs do not break the swells.
- e. Komebail Lagoon: A large number of ships could find good anchorage here which would be sheltered from NE. winds.
- f. Koror Harbor: Good anchorage is said to be available with protection from all directions. About six 500-yd. berths could be located there.
- g. Station Harbor: Four or five 500-yd. berths might be located in the triangular-shaped western portion of the harbor. It could easily be used in conjunction with Malakal Harbor.
- h. Malakal Harbor: This is a safe anchorage as the surrounding high land protects it from winds and waves.
 1. Known anchorage bearings are: Malakal Peak 340°, N. point of Urukthapel 298°, Channel Point 185½°. This is in 10 to 14 fathoms on sandy bottom.
 2. There is one block mooring buoy in the eastern part of the harbor about midway between beacons 29 and 30. Work on a six-year improvement plan was begun in 1936. This will enable 10,000-ton ships to move from Malakal Anchorage to Station Harbor.
 Namai Bay: It has little importance.

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 Palau Islands (Cont'd.)
Malakal Harbor (Cont'd.)



Islets in Lagoon, Malakal Harbor, Palau Islands.

- i. Koror Road: The anchorage area is on a shelf at depths of 5 to 35 fathoms and extends out approximately $1\frac{1}{2}$ miles from the shore reefs. Known anchorage bearings are: Malakal Peak 335° and Ngaremediu 238° in 11 to 17 fathoms.
- j. Schonian Harbor: It is believed that about fifty 500-yd. berths could be found there.
- k. Western Lagoon: It is likely that a large number of craft, especially seaplanes and small vessels, could find anchorage in this lagoon.
- l. Angaur Island: The harbor is well known for phosphorite shipment. Most of the shores are so steep that it is possible for only small craft to anchor close in. W. winds cause swells bad enough that an anchoring cable might be cut.
 1. In January, 1934, the Kayo Maru took shelter on the 16-meter bank between Angaur and Peleliu Islands, to avoid SW. winds and waves at Angaur Harbor, and found it safe.
 2. There are four mooring buoys in front of the pier on the island's W. side. They are also used for a ship's coming alongside the pier, which has an excavated channel leading to it. In loading, the bow and stern of a ship is moored to the four buoys, ropes are led from the bow and stern to land and the ship approaches the loading crane.



Along the N. Coast of Angaur.

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Palau Islands (Cont'd.)

Once inside the reef there are suitable areas for hostile landing parties on the larger islands. There are many sandy or rocky beaches to break the mangrove shore line.

There is ample passage for ships, boats and launches inside the barrier reefs, but it is very difficult to land on the smaller islands which rise from the water in nearly a vertical limestone cliff, with deep undercut at the base or water line. Landings should therefore be made on the larger islands. The coral reefs are razor-sharp and landing forces should have their feet amply protected to cross the reefs.

Enemy information reports the training of Japanese troops in landing operations in the area of Malakal Harbor, "corresponding to new combat locations." The practice operations concerned:

- a. Methods of debarkation along the wooded seashore.
- b. Upstream river operations against obstacles in rivers near the West Channel.
- c. A two stage method of landing by using collapsible boats and rubber boats.
- d. A study of times for landings during low and high tides along coral reef shores in same vicinity.
- e. Essentials of advancing to attack through a coral reef.
- f. Counter measures in case breakdowns or damaged boats.
- g. Points on landing from destroyers.

From N.-S. the Palau group consists of:

Velasco Reef, 08-28-00 N., 134-43-00 E., H.O. Chart 5423:

A submerged encircling reef 20 miles N.-S. and 8 miles E.-W. The water above shoalest part on the outer edge of reef is $6\frac{1}{2}$ fathoms and maximum depth in lagoon is about 32 fathoms. The reef makes a choppy sea but is difficult to recognize by color of the water from a distance.

Ngaruangl Reef, 08-10-00 N., 134-38-00 E., H.O. Chart 5423:

Is an encircling reef about 5 miles NW. of Kayangel Atoll. Inside depths of 5 fathoms has been reported, with many shoals. At NE. there is passage for small boats.

Kayangel Islands, 08-05-00 N., 134-44-00 E.:

S. of Ngaruangl Passage, free from dangers and about 5 mi. wide. Four low islets on the reef with thick growth of coconut trees. A general depth of less than 6 fathoms is found within the lagoon. There is a passage on the W. side where a current of 1 knot setting W. was encountered.

Kossol Passage: Five miles N. of Babelthuap Island, is enclosed by Northwest Reef, Kossol Reef (E.), Cormoran Reef (SW.), offers area well protected from ocean swells but with uneven depths, requiring caution. Coral heads have been blasted out and passages used by large units of the Japanese Fleet.

Kawasak Passage: This passage leads from the E. entrance of Kossol Passage to Palau Harbor along the W. shore of the islands. A small-sized Spanish gunboat is said to have gone along this area between islands and barrier reef. The fairway curves and bends and there are scattered isolated channel reefs, making navigation hazardous.

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Palau Islands (Cont'd.)

Babelthuap Island, 07-43-00 N., 134-38-00 E., H.O. Chart 5423:

Is the largest island among the group, its area being the same as the rest of the islands put together. A range of hills stretches along the center and both sides of the island. The S. part of island is thickly wooded; the northern half has many barren hills and few trees. On the E. side the barrier reef extends at about 2½ miles off the beach on the E. side of the island. It begins at a point near the SE. side of the island and ends at point about 2 miles S. of Melekeiok Point. A British warship is said to have navigated inside the reef on the E. side and anchored near Melekeiok where there is a stone wharf. The stalactite grottoes at Airai on the S. coast, formed by erosion at the water's edge, are famous for their size. Landings on Babelthuap can probably be made most easily on the northern shores from direction of Kossol Passage.

Koror Islands, 07-20-28 N., 134-28-16 E., Obs. Spot:

Koror is approximately at the center of the Palau Island group. It has hilly wooded areas. On the E. side is a fringe of non-drying reef. On the W. is a fringing reef and a barrier reef about 5 to 10 miles out. The channel approach to the island marked by buoys is narrow, winding and long. This is on the SE. of Koror Island, where channel is 100 yds. wide and a least depth of 25 ft., enough depth probably for vessels up to 8,000 tons. There is shoal water 3 miles out on the E., due to reefs. On the W. shoal water extends 4 to 10 miles. There is good anchorage on NW. of Koror and W. of S. half of Babelthuap when wind is E. of a N.-S. line. With W. winds ships must leave anchorage.

The main entrance is through the E. reef, Malakal Pass to Malakal Harbor (Koror Road). The Japanese Fleet uses this harbor which is reported to have a capacity for 50 ships of 10,000 tons or more. On the S. side of Koror is a basin for small boats from 50-100 tons which is said to be fairly safe in time of typhoons. From this outer basin a channel about 150 ft. wide has been cut through the northern end of Aurapushekaru Island, which, according to enemy report, permits ships of 5,000-6,000 tons to enter the inner lagoon at the S. of Koror, called "Matsushima" by the Japanese. (Not confirmed). Certainly launches and barges can proceed from the outer to inner basin S. of Koror.

Landings on Koror would have to be over fringing reefs that protect all beaches. On the E. side the beaches would be 25 miles from nearest ship anchorage outside the main basin.

Arakabesan Island: Located W. of Koror Island. Highest elevation 312 ft. Koror and Arakabesan are connected by a causeway over which buses run. The NW. and N. part of the island are reported covered with coconut groves. There are important military installations on the island. A causeway has also been reported built to Malakal Island.

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CAROLINES (Cont'd)
Palau Islands (Cont'd)

Aurapushekaru Island:

SW. of Koror Island. A passageway of 90 ft. width and 150 yds. long has been blasted through the N. end of the island opposite the SW. end of Koror Island. By use of caissons at each end this might be adaptable as a drydock.

Malakal Island:

Is 330 ft. high and lies to the N. and about center of Malakal Harbor. A causeway connects Malakal with Arakebesan over which buses run.

Urukthapel Island:

To the SW. of Malakal Pass, is long, irregular in shape, 600 ft. high and uninhabited. There is a lighthouse on the SE. point of the island. It is very rocky, with steep limestone cliffs, wooded at the top.

Eil Malk Island:

Is a coral island with irregular coastline and hills rising to about 300 ft. on E. side of the island. It is separated from Urukthapel Island by Yoo Passage.

For further description of approaches, entrances and harbors in the Palau Islands see O.N.I. 29 (May, 1942) pp. 7-12, also photos.

Peleliu Island:

This island is at the southern extremity of the barrier reef. It is low except for range of low hills to the N. The land is fertile and covered with thick growth of trees.

There are several small islands to the N. on the reef.

There is a small harbor at SE. end of the island inaccessible to large ships which anchor S. of the island, cargo unloaded into lighters and towed by launch.

There are phosphate deposits worked by the S.S. Development Co.

The water supply is rainwater catchment. An enemy source mentions the use of about 30 tanks placed between barracks on the E. central part of the island (see chart). Taro is also cultivated on Peleliu.

There is a good automobile road from the village of Akalokul at the N. to the village of Asias (Ashiasu) in the SE. Another road runs from Asias to Attalabul in the SW. Roads also run to the N. of the island and may now be developed to accommodate motor vehicles.

Enemy source reports a motor road running from the harbor via the village to the airfield. It has a good coral dust surface, quite hard and wide enough for two cars. There are four or five trucks to transport rations, ammunition and fuel to the airfield. There is a staff car for officers. On Peleliu there is a narrow railway, operated by man power running from the phosphate factory to the pier on the N. shores.

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CAROLINES (Cont'd)
Palau Islands (Cont'd)

A wharf more than 100 yards long at which lighters can dock is located in front of the phosphate refinery. There is no loading apparatus reported. Lighters are used for harbor transportation. They are towed from W. of Ngeregong Island to Akalokul at the N. of Peleliu Island. There are numerous sampans some with motors used between Koror, Angaur and Peleliu Islands.

Buildings - At Akalokul (N. tip of the island) the phosphate crushing plant is 3 stories high, built of wood, has two tall smoke stacks and is surrounded by nine buildings. There are numerous barracks, hangars, and military installations on the southern part of the island

There is a good airfield on Peleliu with control tower (see 603-300). A seaplane anchorage is also reported.

Enemy sources report an electric power house recently constructed N. of the central airdrome. It is of reinforced concrete construction, the walls being 2' 5" thick and roof 2' 8". It is reported camouflaged with sand and shrubs.

Enemy source reports that prior to building the airfield in 1940 a company had worked the surface of the hills for bauxite ore. This had been discontinued and the machinery removed.

Enemy source also reports underground storehouse for ammunition and gasoline, located about 330 yards N. of Asias Village in the direction of the airfield. The chamber was described as built into a raised piece of land. Size 24' x 30 meters and 12-ft. high walls 1' 3" thick. Divided in two compartments, one for ammunition and one for gasoline. The gasoline was kept in drums. The storehouse was camouflaged with grass and shrubs and invisible from the air.

W/T - There are two wireless towers situated on a hill about 10 minutes walk from the harbor. According to enemy report these towers had at their summit a flashing red light and below this light a net work of wires in square frame which was fixed and did not rotate. These frames were connected to each other by three wires. These aerial towers were connected by wire to the wireless station on the airfield. This wireless station was a single room with four different colored lights on the wall connected by two controls on the operation deck.

There were two flat-roofed buildings in front of the towers, the larger being an electric power house and smaller one having two tanks 8' diameter by 12 ft. high. There was a large water tank outside the buildings. Buildings camouflaged with sand and shrubs.

Angaur Island, 6-54-00 N., 134-09-00 E. H.O. Chart 5423:

This is the most southern of the Palau group and formed of coral reef mixed with phosphate deposits which is mined. It is well covered with trees. There is a fringing reef on the W.-SW. extending $\frac{1}{2}$ mile. At other points the coast is clear and approached easily.

Angaur Harbor is on the W. with limits of 1 mile radius with extremity of pier of phosphate mining place. Vessels are usually moored to buoys as the island is steep-to. In W. winds the anchorage is unsafe and vessels leave at short notice.

Saipan Village is located on the W. side of the island (see Section 602). The best landing beaches appear to be on NE., N. of NE. pier, on E., N. of Rocky Point and over reef on the SW. at high tide.

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CAROLINES (Cont'd.)

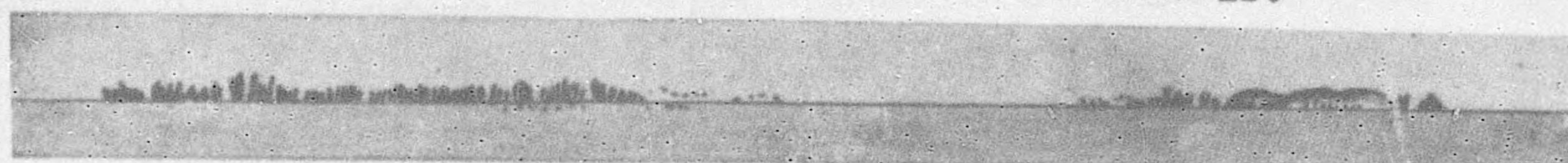
Sonsorol (St. Andrew) Islands: 5-20-00 N., 132-13-00 E. H.O. Chart 5426

Consists of two small islands surrounded by fringing reef, separating channel 1200 yds. wide, free from dangers. Thickly wooded with coconut and other trees.

SONSOROL ISLAND

Sonsorol Is.

Banna Is.



266°

272° 13 naut. mi.

277°

It is reported that boats can land at high tide in heaviest surf. In 1935 population reported as 153 natives and 7 Japanese. A radio station in operation. Since 1940 call letters HMA. A-1 type transmission over 5420 Kc-75 watts. This island may be used as observation post.

Pulo Anna Island: 4-39-38 N., 131-58-03 E. H.O. Chart 5426.

An egg-shaped island about $\frac{1}{2}$ mile SW.-NE and $\frac{1}{4}$ mile NW.-SE. in size with a fringing reef and densely wooded. The reef is steep-to. A few inhabitants are reported. Island of possible value as observation spot. No anchorage. In front of canoe houses on white sand shore W. coast small boats can enter at high tide. A strong ebb tide current setting E., NE. of the island is reported with drift of 0.5 knots to 3 knots near the island and rip tide N. of the island.

PULO ISLAND



93° 13 naut. mi.

Merir Island: 4-19-58 N., 132-18-51 E. at Obs. Spot. H.O. Chart 5426.

An elongated island N.-S. 1.3 N. miles N.-S and 0.3 N. miles wide. Low-lying with coconut and miscellaneous trees. Surrounded with wide fringing reef extending to 1300 yds. at S. end. There is a shoal at N. end with depth of 7 fathoms at N. extremity where vessels sometimes anchor. Near narrow S. end of island a boat can reach land on lee side at high tide.

Tobi Island: 3-00-50 N., 131-10-37 E. at Obs. Spot. H.O. Chart 5426.

This island is 1600 yds. N.-S. and circumference of 2 nautical miles. Fringing reef with greatest width on N.E. Island covered with coconut palms with cultivated area in center. Inhabited with most houses on S. and W. On S. side of island near a pier are two or three large mooring buoys. An excavated channel leads to the pier.

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CAROLINES (Cont'd.)
Tobi Island (Cont'd.)

On W. side of island commencing from the center are four or five barren sand hills which appear artificial. Between these two hills are lines which appear similar to trenches or rails. This is probably in connection with radio station construction which is thought to be on this island. A weather station has been confirmed.

A detachment of 3rd Defense Force has been reported. There is an air field and seaplane anchorage. On the NE. side of the island are 6-8 white buildings of native construction, having appearance of residences. Landings - can be made on W. side of the island with caution in westerly winds.

Population - in 1935 it was reported there were 171 natives and 9 Japanese.

Helen Reef: 2-55-00 N., 131-48-00 E. H.O. Chart 5426.

About 35 miles eastward of Tobi Island. Surrounded by a narrow belt of coral on which the sea breaks heavily. Helen Islet lies at the N. end of the reef. At high water when the sea is smooth there are sometimes no breakers on the reef so that it becomes dangerous to approach it at night. There is a sea-plane anchorage here.

Entrances - Although the reef is generally dry at the lowest tides. There is a channel into the lagoon, near the middle of the western side. For about 2 hours near the time of high water the reef can be crossed by boat on the W. side of the islet.

Shipping - Careful surveys and periodical visits by warships.

Buildings - An aerial reconnaissance showed that in the center of the island there are four small buildings with corrugated iron roofs of the color of the surrounding trees and bushes. They are invisible from the sea.

Radio - Naval radio D/F (1941).

Fortifications - Detachment of a Japanese Defense Force and Naval Yard Units reported.

Aviation Facilities - There is a lagoon (10 miles by 4 miles) which is suitable for submarines and seaplanes and as an anchorage for a fleet and convoy. It is well protected from submarine attack but completely exposed to view.

Seaplane Base - At N. end of reef. Two large mooring buoys are reported.

Resources - Many turtles inside the lagoon. Possible fuel stocks.

Mapia Islands: 0-49-00 N., 134-17-00 E. at Pegun Island. H.O. Chart 5426.

Consists of three islands on the N., NE. and S. rim of an oval atoll 9 miles N.-S. The islands are low with coconut trees. There is usually a surf over the reef but caution should be exercised in approaching. The lagoon is filled with rocks. It is possible for boat to enter through winding channel on W. side more than 2 miles N.-NW. of N. end Pegun Island. A settlement on the S. end of Pegun was the headquarters of an American agricultural concession (H.O. 164 p.578). No good anchorages. Possible anchorage on side of atoll during good weather. Landing place near settlement on Pegun Island at high tide during good weather. Winds principally E.-SE. Currents observed setting westward at $1\frac{1}{2}$ knots.

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600 - Geography
 601 - Physical Features
 140 - Inland Terrain

Since the Mandated Islands are principally coral atolls and small islands, inland terrain is covered in Section 601-130; and also in 602-300.

600 - Geography
 601 - Physical Features
 150 - Geology, Flora, Fauna

Geologically, the Mandated Group is classified into three groups - volcanic islands, coral islands, and coral reefs. There is a scarcity of alluvial soil and a lack of an adequate water supply.

The most numerous and valuable plants are the coconut palm, breadfruit, taro, yam and pandanus.

There is little variety of animal life, the only indigenous mammals being moles and bats. Domestic animals have been imported. Pigs and fowl are numerous; livestock, due to insufficient pasturage, is not. Harmful animals are also scarce. Carnivorous animals and venomous snakes are entirely absent. Anopheles or malaria-bearing mosquitoes also absent.

There are rich and varied aquatic products.

MARIANAS - These are a chain of steep volcanic islands.

MARSHALLS - All of this group are of coral formation and, aside from a few single islands, the atoll type is characteristic. The pandanus tree, and fruit, is especially numerous and in season from June to October. The nut kernels can be extracted from the dried fruit at other times of the year. Breadfruit trees are cultivated in the northern Marshalls from July - September. In the southern Marshalls, they ripen all year. Fish is a food staple, but care must be shown, since a few poisonous fish have been reported.

Among the pests on the islands are the common fly, mosquitoes and scorpions. There are no fleas or bugs, however.

CAROLINES - These are coral islets or atolls with the exception of Ponape, Truk, Kusaie and Yap. The first three are of volcanic formation, while Yap is a sedimentary rock. The islands range from fairly large, with mountains and streams, to small islets and mere reefs.

600 - Geography
 601 - Physical Features
 160 - Bases, Important Places

From N.-S. and E.-W. the most important places in the Mandated area are:

MARIANAS:

Saipan Island

Garapan City)
) 15-12-15 N., 145-43-15 E.
 Tanapag Harbor)

Tinian Island

Tinian Harbor Settlement - 14-58-00 N., 145-37-35 E.

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 160 - Bases, Important Places

MARIANAS (Cont'd.)

Rota Island

Rota Village - 14-08-20 N., 145-08-47 E.

MARSHALLS:

Pokaaku Atoll

Pokaaku Air Base - 14-35-00 N., 169-00-00 E.

Wotje Atoll

Wotje Air Base - 09-27-31 N., 170-14-32 E.

Maloelap Atoll

Taroa Air Base - 08-42-46 N., 171-13-47 E.

Mille

Mille Base - 06-05-00 N., 171-44-00 E.

Eniwetok Atoll

Eniwetok Air Base (Engebi and Eniwetok Islands) - 11-20-34 N., 162-20-32 E.

Rongelap Atoll

Rongelap Anchorage (Naval and Seaplane) - 11-08-55 N., 166-53-35 E.

Kwajalein Atoll

Air and Naval Base (Roi and Kwajalein Islands) - 09-23-37 N., 167-28-06 E.

Jaluit Atoll

Air and Naval Base (Jabor Town - Emidj - Enybor - Aineman Islands) - 05-55-08 N., 169-38-51 E.

EAST CAROLINES

Kusaie Island

Lele Harbor and Village - 05-20-07 N., 163-01-23 E.

Ponape Islands

Ponape Harbor and "Colony" Town - 06-59-31 N., 158-13-42 E.

Kapingamarangi Atoll

Kapingamarangi Seaplane Airport - 01-02-00 N., 154-47-50 E.

WEST CAROLINES

Truk Islands

Truk Fleet and Air Base (Dublon - Eten Islands, Town of Truk) - 07-21-25 N., 151-53-20 E.

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WEST CAROLINES (Cont'd.)

Woleai Atoll

Woleai Anchorage - 07-22-19 N., 143-54-20 E.

Yap

Tomil Harbor and Base - 09-30-30 N., 138-08-17 E.

Palau Islands

Koror City and Major Base - 07-20-28 N., 134-28-16 E.
 Saipan Village (Angaur Island) - 06-53-52 N., 134-08-19 E.

600 - Geography
 601 - Physical Features
 200 - Frontiers, Approaches

Approaches to the Mandated Islands are over wide sea distances and by air. The nearest points now in Allied hands are (stated in nautical miles):

From NE: Midway - 1500 miles to Eniwetok
 Midway - 1335 miles to Wotje
 Pearl Harbor - 1920 miles to Maloelap

From SE: Funafuti - 1025 miles to Jaluit
 Makin - 250 miles to Jaluit; 195 miles to Mille

From S: Henderson Field - 1100 miles to Jaluit
 Henderson Field - 1124 miles to Truk
 Port Moresby - 1047 miles to Truk
 Finschaven - 870 miles to Truk
 Finschaven - 1020 miles to Ponape
 Lae (N. G.) - 894 miles to Truk

From W: The nearest air field in Allied hands from which reconnaissance could be carried out from a W. direction is at Namyung (Nanhsiung) on the border of Kwantung - Kiangsi Provinces, China, the distance being 1700 statute miles to Palau.

Air distances stated in statute miles would be roughly 15% greater. Reconnaissance from carrier based planes and submarines is necessary to cover the entire mandated area. Land based planes on Guadalcanal and New Guinea can reach nearest islands on the southern edge of the Mandates. Low-lying islands in the Marshalls offer little help as they are visible only for short distances. Navigation near and within the island groups is attended with hazard due to the possibility of uncharted reefs. In the W. Carolines (E. of 150°) the period July - September is a typhoon period. The summer period is attended with daily squalls, also the currents near the islands are tricky and have caused ships to go on the reefs. The climate and weather lists, Section 601-100, give details on cloudiness and visibility in the different areas and seasons.

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600 - Geography
 601 - Physical Features
 300 - Denied and Unfavorable Areas - Disease

The lack of detailed knowledge of landing beaches and the general presence of fringing and barrier reefs about the atolls and islands is an unfavorable factor in landing operations. In some areas the mangrove swamps present a further barrier to the free movement of troops. More detailed reference is made in 601-130 and 604.

Sewage disposal methods are primitive. Flies are found in great numbers on all the islands. Japanese reports no anopheline mosquitoes on the islands and no malaria. In German reports prior to 1914 there was mention of malaria. Japanese reports state that no cases of cholera, plague, yellow fever, typhus fever or sleeping sickness occurs on the islands. A list of endemic transmissible diseases would include the following: typhoid fever, paratyphoid fever, amoebic dysentery and bacillary dysentery; venereal diseases, i.e., syphilis, gonorrhoea and chancroid; yaws; leprosy; intestinal parasitism; tuberculosis; influenza; an obscure ophthalmic, and dermatological disorders, especially ringworm and mycotic infections.

There are hospitals located on Saipan, Jaluit, Kusaie (branch of Ponape hospital) Ponape, Truk, Yap, Palau, Angaur. A 1938 report states that there were 25 doctors, 7 pharmacists, 35 midwives and 9 assistant doctors. See Section No. 25 on Health and Sanitation in the Marshalls Military Government Handbook (OPNAV 50 E-1 (Aug. 17, 1943) pp. 69-77.)

600 - Geography
 601 - Physical Features
 400 - Roads

There are a number of usable roads in the larger islands. At the end of 1931 there were 220 miles of roads of 6 ft. width and 155 miles with a width of nine feet or more.

MARIANAS - There are about 50 miles of limestone surfaced roads on Saipan. There are three main roads on the island in addition to the limestone paved streets in the town of Garapan. (See Section 602.) In Tinian there are a few roads but not kept in good repair.

On Rota a road was being constructed from Sosanjaya Bay along the NW. shore of the island.

An estimate of automobiles and other vehicles in the Marianas in 1936 is given as: 159 motor cars, 25 motorcycles, 11 wagons, 9,351 bicycles, and 3,242 carts. There are a number of Chrysler and Ford cars reported.

Roads for military use have undoubtedly been improved and extended as well as military vehicles increased.

MARSHALLS - Prior to about 1935 few good roads for use of vehicles existed in the Marshalls. Since that time there is evidence of development of roads suitable for military use in the larger islands.

Roads are made of powdered coral, some with concrete surfaces - a system of encircling and bisecting roads has been developed on strategic islands as Jaluit, Kwajalein, Wotje and Maloelap. In some of the atolls causeways have been constructed to connect the larger islands on the fringing reefs. Trucks, passenger cars and bicycles are used. Many of the atolls have coral paths which can be widened and surfaced for military use. (See Section 602 for details of specific areas.)

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600 - Geography
 601 - Physical Features
 400 - Roads

CAROLINES - A few roads on the principal islands were built in German times. These have been improved and extended for military use in the strategic islands, as Kusaie, Ponape, Truk, Yap and Palau. In Yap there is a network of excellent roads, considered adequate for modern vehicles. On the more important islands the Japanese have, in many cases, worked out a system of an encircling road near and parallel to the shore line with extensions inland or across the island. Most of these roads are believed suitable for use of artillery units.

In the Palau group the islands of Koror, Arakabesan and Malakal are connected by a surfaced road built on piles over the sea. Buses and passenger cars are used. Trucks and other military vehicles are also in use. (See development of particular areas under Sec. 602.)

600 - Geography
 601 - Physical Features
 500 - Rivers, Lakes, etc.

There are no lakes or rivers of importance in the Mandates.

MARIANAS - In the Marianas, near the center of Tinian Island a lake is reported as a seaplane landing. Also near the center of Babelthuap Island in the Palau group there is a lake reported as a seaplane anchorage. There are mountain streams on the Mariana Islands, the water supply in them being dependent on the amount of rainfall. There is ground water in the limestone and it can be obtained by wells. Good water is available in the larger islands. The rock of the active or dormant volcanoes in the northern islands is fractured and porous, and streams scarce. Springs exist and fresh ground water is available.

MARSHALLS - There are no streams in the Marshalls, but there are pools of brackish water. Rainwater caught in cisterns is the main source of supply. There are a few shallow wells on most of the larger islands.

CAROLINES - In the Carolines on some of the larger volcanic islands, such as Ponape, streams are numerous and surface water plentiful. There are some small waterfalls. Fresh surface water is lacking on the coral islands.

600 - Geography
 601 - Physical Features
 600 - Shipping

Prior to the outbreak of the war four shipping lines normally connected the Japanese Mandated islands with Japan. Practically no non-Japanese ships entered the area.

The four lines, operated by the Nippon Yusen Kaisha, were routed as follows:

1. East-bound Line operating 2 ships making 10 trips per year on the following itinerary: Kobe, Moji, Yokohama, Saipan, Truk, Ponape, Kusaie, Jaluit and return via same ports of call, 7320 nautical miles, each trip lasting 50 days.
2. West-bound Line operating 2 ships, making 20 trips per year over the following route: Kobe, Moji, Yokohama, Saipan, Tinian, Yap, Palau, Angaur, Tobi, Menado, Davao, Angaur, Palau, Yap, Tinian, Saipan, Yokohama, Osaka, Kobe. Distance 7000 nautical miles. Time, 44 days.

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600 - Geography
 601 - Physical Features
 600 - Shipping

3. Saipan Line operating 2 ships, 24 trips per year, calling at Kobe, Moji, Yokohama, Fushimi, Saipan, Tinian, Rota, Tinian, Saipan, Fushimi, Yokohama, Osaka, Kobe. Distance, 3800 nautical miles. Time, 27 days.
4. East-West Connecting Line, operating 1 ship covered following route 6 times each year: Kobe, Moji, Yokohama, Palau, Angaur, Truk, Ponape, Kusaie, Jaluit, and return. Distance, 9200 nautical miles. Time, 42 days.

In addition to the above shipping routes the ships of the S. Seas Marine Transport Company touched Palau 6 times annually in running between Japan and Java.

The S. Seas Development Company ran a ship a year between Paulau.- Yap - Truk.

The S. Seas Trading Company (Nanyo Boeki Kaisha) operated a number of small inter-island steamers.

It will be seen that the shipping facilities were substantially developed virtually as a Japanese monopoly. It is assumed that these routes have been taken over and supplemented for military requirements in moving the military supplies and personnel since 1941.

A recent study of Japanese merchant shipping points up graphically the heavy shipping of military supplies into the Mandated area. Palau and Truk are the points of largest traffic flow, both into the area and through to the concentration points at Rabaul.

The number of difficult routes followed point out the lack of any single bottleneck area, the web-like nature of the shipping route pattern forming a protection. The outer eastern rim of the Marshalls and the lines running to Truk through Chichijima and Saipan areas seem the best target area for our submarine activity.

Details of known shipping facilities are further developed under specific places in Section 602 and in 604-500.

600 - Geography
 601 - Physical Features
 700 - Railways

Of the total 105 miles of track, 93 miles of 30 in. gauge is used for transporting sugar cane and products on Saipan and Tinian. About 12 miles of 24" gauge is used on Anguar in the phosphate industry. See Section 602.

600 - Geography
 601 - Physical Features
 800 - Electric Power

As many as 40 generators are reported throughout the Mandates with 4000 KW total power. They supply the radio stations, electric lights, telephone system, ice plants, and sea water condensing units for supplementary water supply. Most of these generators operate on diesel engines. See further details in Section 602.

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600 - Geography
 601 - Physical Features
 1400 - Air Lines, etc.

Prior to Dec. 7, 1941 two commercial air lines were in operation:

1. Yokohama - Saipan - Palau 2400 S.M. round trip every 2 weeks, Kawanishi 4 motor flying boats, 20 passenger capacity.
2. Palau - Tinian, Kawanishi flying boats, 2 flights per month, 930 S.M.

These further inter-island flights were projected:

- (a) Palau - Yap - Ponape - Jaluit, 2600 S.M.
- (b) Saipan - Truk, 700 S.M.
- (c) Tansui Formosa - Palau, 1730 S.M.

It is believed all of the above routes are in operation for commercial and military purposes, probably with increased traffic schedules.

For military purposes routes have been extended through the Marianas - Saipan - Tinian - Truk to Rabaul. Also the ferrying of military planes to the eastern perimeter in the Marshalls has been carried out through Tinian - Kwajalein - Wake and S. from Kwajalein. Truk is an airplane assembly and distributing point for the East and West operations. The coral island lagoons form anchorages and emergency landing and take-off areas for sea-planes. Land areas for airfields are also numerous over wide areas.

On the atolls the soil is easily built into suitable runways by use of concrete or sand mixed into the porous top soil. Any breaking up of runways by weight pressure is easily repaired.

In the Marianas and in parts of the Carolines volcanic peaks are landmarks for air navigation. The low-lying coral islands do not afford such landmarks but offer no considerable hazard. The extension of weather stations and radio facilities aid air navigation throughout the area.

The following is an estimate of the present and potential facilities. The known and reported bases, landing fields, and anchorages are further described in Section 603-300.

Summary of Air Fields and Seaplane Landing and Take-off Places.

<u>Landplanes</u>	<u>Marianas</u>	<u>Marshalls</u>	<u>Carolines</u>	
<u>Known</u>	3	6	8	
<u>Reported</u>	1	6	16	
<u>Potential</u>	-	15	20	Total
	<u>4</u>	<u>27</u>	<u>44</u>	75
<u>Seaplanes</u>				
<u>Known</u>	6	20	25	
<u>Reported</u>	2	5	19	
<u>Potential</u>	-	8	5	Total
	<u>8</u>	<u>33</u>	<u>49</u>	<u>90</u>

Estimated Grand Total 165

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600 - Geography
601 - Physical Features
1400 - Air Lines, etc.

Table of Aircraft Facilities.

For LANDPLANES.

NOTE: Islands are classified by groups, and in a north to south, east to west, order. "Base" indicates full facilities (refuelling, repair, hangars, etc.); "Airport" indicates limited facilities; "Field" indicates few or no facilities.

KNOWN

Marianas:

Pagan	18-07-24 N., 145-46-36 E.	Airport
Saipan	15-07-48 N., 145-44-18 E.	Base
Tinian	15-03 N., 145-38 E.	Base

Marshalls:

Wotje	09-27-42 N., 170-14-48 E.	Base
Maloelap	08-42-30 N., 171-14-00 E.	Base
Mille	06-05-00 N., 171-43-54 E.	Base
Eniwetok	11-39 N., 162-15 E.	Base
Kwajalein	09-23-30 N., 167-28-18 E.	Base
Kwajalein	08-48 N., 167-37 E.	Airport

Carolines:

Ponape	06-58-30 N., 158-11 E.	Airport
Ponape	06-57-00 N., 158-12 E.	Airport
Truk (Moen)	07-27 N., 151-51 E.	Airport
Truk (Eten)	07-21-30 N., 151-53-30 E.	Base
Yap	09-33 N., 138-10- E.	Field
Palau (Arakabesan)	07-21-10 N., 134-27-15 E.	Base
Palau (Eil Malk)	07-09-10 N., 134-22-30 E.	Airport
Palau (Peleliu)	07-00 N., 134-15-00 E.	Airport

REPORTED, UNCONFIRMED

Marianas:

Farallon de Pajaros	20-32 N., 144-54 E.	Airport
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Marshalls:

Pokaaku	14-36-00 N., 169-00-00 E.	Field
Eniwetok	11-20-30 N., 162-21-00 E.	Airport
Kwajalein	08-42-48 N., 167-44-18 E.	Airport
Lae	08-55 N., 166-13 E.	Field
Jaluit	06-00-24 N., 169-43-48 E.	Airport
Jaluit	05-56-06 N., 169-39-48 E.	Airport

Carolines:

Kusaie	05-19 N., 163-02 E.	Airport
Ponape	06-59-30 N., 158-13-50 E.	Airport
Ponape	06-56 N., 158-09 E.	Field
Ponape	06-50 N., 158-11 E.	Field
Truk (Dublon)	07-22-06 N., 151-53-06 E.	Field
Truk (Dublon)	07-22 ? N., 151-52 ? E.	Field
Truk (Uman)	07-18 N., 152-53 E.	Field

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600 - Geography
 601 - Physical Features
 1400 - Air Lines, etc.

Carolines: (Cont'd.)

Truk (Tol)	07-22	N., 151-37	E.	Field
Ifalik	07-15	N., 144-27	E.	Field
Sorol	08-08	N., 140-25	E.	Field
Ngulu	08-17-50	N., 137-29-20	E.	Field
Palau (Babelthuap)	07-22	N., 134-34	E.	Field
Palau (Koror)	07-20	N., 134-28	E.	Field
Palau (Urukthapel)	07-15	N., 134-25	E.	Field
Tobi	03-00	N., 131-11	E.	Field
Helen Reef	02-58	N., 131-49	E.	Field

LANDPLANES

POTENTIAL FIELDS

Marshalls:

Utirik	11-14	N., 169-51	E.
Likiep	09-50	N., 169-18	E.
Aur	08-07	N., 171-19	E.
Arno	07-06	N., 171-54	E.
Majuro	07-08	N., 171-22	E.
Ujelang	09-46	N., 160-58	E.
Bikini	11-30	N., 165-32	E.
Rongelap	11-08	N., 166-53	E.
Rongerik	11-17	N., 167-28	E.
Wotho	10-10	N., 166-00	E.
Ujae	09-08	N., 165-38	E.
Namu	07-45	N., 168-13	E.
Ailinglapalap	07-34	N., 168-57	E.
Namorik	05-36	N., 168-06	E.
Ebon	04-35	N., 168-41	E.

Carolines:

Kusaie	05-24	N., 163-01-30	E.
Pingelap	06-13	N., 160-42	E.
Ngatik	05-49	N., 157-10	E.
Minto Reef	08-30	N., 154-20	E.
Kapingamarangi	01-02	N., 154-47	E.
Nomoi	05-19	N., 153-44	E.
Murilo (Hall)	08-32	N., 151-57	E.
Truk (Fefan I.)	07-20	N., 151-52	E.
Namonuito	08-35	N., 149-40	E.
Pulap	07-38-30	N., 149-25-10	E.
Puluwat	07-22	N., 149-10-30	E.
Pulusuk	06-41	N., 149-19	E.
Satawal	07-21	N., 147-02	E.
Lamotrek	07-28	N., 146-24	E.
Olimarao	07-42	N., 145-52-40	E.
Faraulep	08-36	N., 144-33	E.
Woleai	07-22-30	N., 143-54-30	E.
Fais	09-46	N., 140-32	E.
Ulithi	09-55	N., 139-40	E.
Palau (Angaur)	06-54	N., 134-09	E.

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600 - Geography
601 - Physical Features
1400 - Air Lines, etc.

For SEAPLANES:

NOTE: "Base" indicates full facilities; "Airport" indicates anchorage and limited facilities; "Anch. (E)" indicates emergency anchorage with few or no facilities.

KNOWN

Marianas:

Maug	20-01-30 N., 145-13-30 E.	Airport
Pagan	18-08 N., 145-46 E.	Anch. (E)
Saipan	15-13-06 N., 145-40-18 E.	Base
Saipan	15-09-00 N., 145-46-00 E.	Anch. (E)
Tinian	14-57 N., 145-38 E.	Anch. (E)
Rota	14-08 N., 145-09 E.	Anch. (E)

Marshalls:

Pokaaku	14-36-00 N., 169-00-00 E.	Airport
Bikar	12-12 N., 170-06 E.	Anch. (E)
Utirik	11-14 N., 169-51 E.	Airport
Ailuk	10-12-53 N., 169-58-53 E.	Anch. (E)
Wotje	09-27-54 N., 170-14-12 E.	Base
Malcoelap	08-42-30 N., 171-13-36 E.	Base
Arno	07-06-35 N., 171-54-30 E.	Anch. (E)
Mille	06-13-10 N., 171-48-12 E.	Anch. (E)
Eniwetok	11-21-00 N., 162-21-30 E.	Airport
Ujelang	09-46-29 N., 160-57-43 E.	Anch. (E)
Bikini	11-37 N., 165-32-10 E.	Anch. (E)
Rongelap	11-16-30 N., 166-53-30 E.	Anch. (E)
Rongelap	11-09-00 N., 166-53-30 E.	Airport
Wotho	10-10-00 N., 166-00-00 E.	Anch. (E)
Kwajalein	09-23-00 N., 167-28-24 E.	Anch. (E)
Kwajalein	08-46-18 N., 167-44-12 E.	Base
Ujae	09-07-55 N., 165-38-10 E.	Anch. (E)
Namu	07-50 N., 168-17 E.	Anch. (E)
Jaluit	06-00-48 N., 169-43-30 E.	Base
Jaluit	05-55-00 N., 169-38-48 E.	Airport

Carolines:

Kusaie	05-20-10 N., 163-01-15 E.	Airport
Kusaie	05-21-00 N., 162-57-20 E.	Anch. (E)
Ponape	06-56-55 N., 158-06-15 E.	Anch. (E)
Ponape	06-52-30 N., 158-18-30 E.	Anch. (E)
Ponape	06-48 N., 158-10 E.	Anch. (E)
Ngatik	05-49-30 N., 157-12-00 E.	Anch. (E)
Kapingamarangi	01-02-24 N., 154-47-42 E.	Airport
Nomoi	05-30-06 N., 153-49-10 E.	Airport
Nomoi	05-19-50 N., 153-44-15 E.	Anch. (E)
Losap	06-53-42 N., 152-43-52 E.	Anch. (E)
Truk (Dublon)	07-22 N., 151-53 E.	Base
Namonuito	08-35-12 N., 149-39-50 E.	Anch. (E)
Namonuito	08-35-00 N., 149-39-21 E.	Anch. (E)
Puluwat	07-21-25 N., 149-11-30 E.	Anch. (E)
Lamotrek	07-27-48 N., 146-23-10 E.	Anch. (E)
Elato	07-30-50 N., 146-10-55 E.	Anch. (E)
Olimarao	07-42-00 N., 145-52-40 E.	Anch. (E)

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600 - Geography
601 - Physical Features
1400 - Air Lines, etc.

Carolines: (Cont'd.)

Faraulep	08-35-45 N., 144-33-05 E.	Anch. (E)
Ifalik	07-15 N., 144-27 E.	Anch. (E)
Woleai	07-22 N., 143-54 E.	Anch. (E)
Sorol	08-08-55 N., 140-24-22 E.	Anch. (E)
Ulithi	10-03-00 N., 139-45-30 E.	Anch. (E)
Yap	09-31-18 N., 138-08-06 E.	ANCH. (E)
Palau (Malakal)	07-19-30 N., 134-27-30 E.	Airport
Helen Reef	02-57 N., 131-49 E.	Anch. (E)

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Marianas:

Farallon de Pajaros	20-32 N., 144-54 E.	Base
Tinian	15-00 N., 145-39 E.	Anch. (E)

Marshalls:

Likiep	09-50 N., 169-18 E.	Anch. (E)
Majuro	07-07 N., 171-22 E.	Airport
Mille	06-05-00 N., 171-44-30 E.	Anch. (E)
Kwajalein	08-43 N., 167-44 E.	Anch. (E)
Ebon	04-36-55 N., 168-40-15 E.	Airport

Carolines:

Mokil	06-41 N., 159-47 E.	Anch. (E)
Ponape	06-59 N., 158-13-30 E.	Airport
Oroluk	07-37-00 N., 155-10-00 E.	Anch. (E)
Namoluk	05-55-25 N., 153-08-40 E.	Anch. (E)
Hall	08-33 N., 151-52 E.	Anch. (E)
Hall	08-26-20 N., 151-44-15 E.	Anch. (E)
Truk (Moen)	07-25 N., 151-50 E.	Anch. (E)
Truk (Uman)	07-18 N., 152-53 E.	Anch. (E)
Truk (Tol)	07-20-36 N., 151-38-18 E.	Anch. (E)
West Fayu	08-05-07 N., 146-44-18 E.	Anch. (E)
Gamen Reef	07-22 N., 144-32 E.	Anch. (E)
Ngulu	08-18 N., 137-29 E.	Anch. (E)
Palau (Babelthuap)	07-30-00 N., 134-35-00 E.	Airport
Palau (Koror)	07-20-00 N., 134-28-30 E.	Anch. (E)
Palau (Arakabesan)	07-21-30 N., 134-26-55 E.	Airport
Palau (Peleliu)	07-01 N., 134-16 E.	Airport
Palau (Angaur)	06-54 N., 134-08 E.	Anch. (E)
Kayangel	08-05-00 N., 134-43-15 E.	Anch. (E)
Tobi	03-01 N., 131-10 E.	Anch. (E)

SEAPLANES

POTENTIAL (EMERGENCY) ANCHORAGES

Marshalls:

Taka	11-07 N., 169-40 E.
Erikub	09-12 N., 169-58 E.
Aur	08-07 N., 171-19 E.
Rongerik	11-17 N., 167-28 E.
Ailinginae	11-10 N., 166-30 E.
Ujae	09-05 N., 165-38 E.
Lae	08-56 N., 166-13 E.
Ailinglapalap	07-34 N., 168-57 E.

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600 - Geography
601 - Physical Features
1400 - Air Lines, etc.

Carolines:

Pingelap	06-13 N., 160-42 E.
Ant	06-47 N., 157-57 E.
Nukuoro	03-51 N., 154-58 E.
Pulap	07-38 N., 149-25 E.
Eauripik	06-41-12 N., 143-04-47 E.

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600 - Geography
 602 - Cities, Towns, Places
 050 - Place Index

The following towns, bases, or harbors, the most important in the Mandated Area, are treated in detail in Section 602: (listed alphabetically).

<u>Area</u>	<u>Island or Atoll</u>	<u>Page No.</u>
Eniwetok Air Base	Eniwetok Atoll	60/194-197
Garapan Town; Tanapag Harbor	Saipan Island	60/159-166
Jaluit Air and Naval Base	Jaluit Atoll	60/203-212
Kapingamarangi Seaplane Airport	Kapingamarangi Atoll	60/224-227
Koror City and Base	Palau Islands	60/246-252
Kwajalein Air and Naval Base	Kwajalein Atoll	60/200-202
Lele Harbor and Village	Kusaie Island	60/213-216
Mille Island Base	Mille Atoll	60/190-193
Pokaaku Seaplane Airport	Pokaaku Atoll	60/179-181
Ponape Harbor and "Colony" Town	Ponape Island	60/217-223
Rongelap Anchorage	Rongelap Atoll	60/198-199
Rota Village	Rota Island	60/173-178
Saipan Village	Angaur Island	60/253-257
Tarca Air Base	Maloelap Atoll	60/187-189
Tinian Town and Harbor	Tinian Island	60/167-172
Tomil Harbor and Base	Yap Island	60/242-245
Truk Fleet and Air Base	Truk Atoll	60/228-238
Woleai Seaplane Anchorage	Woleai Islands	60/239-241
Wotje Air Base	Wotje Atoll	60/182-186

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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance, Features

GARAPAN TOWN and TANAPAG HARBOR, on Saipan Island - 15-12-15 N., 145-43-15 E.
At Garapan Town. H.O. Chart 5359.

Garapan Town, the main settlement, is located about in the middle of the western side of Saipan Island. Garapan Anchorage lies just off the town. To the N. is Tanapag Harbor, an anchorage for ships and a seaplane base. Population including military personnel, is concentrated here. Fortifications, stores, seaplane hangars and facilities, docks, radio station, military headquarters, etc. are located in this area. Saipan is the main base in the Marianas, and one of the major bases in the Mandated Area. (See Map of Garapan Town, next page).

600 - Geography
 602 - Cities, Towns, Places
 200 - Population

In 1936, there was a population in Garapan of at least 12,000 of which about 3/4 were Japanese, and the rest natives. A good many of these were connected with the plantations. The population, especially military personnel, has undoubtedly increased since then.

Garapan Town is divided into 8 wards. These wards, with the 1935 census figures, are as follows:

1. Minami (South)Garapan	2,031	Japanese	1,300	Natives
2. Kita (North) Garapan	5,461	"	1,594	"
3. Point Mutcho	410	"	54	"
4. Fuanaganama	316	"	0	"
5. Potoriko	404	"	0	"
6. Sadokutgshi	196	"	0	"
7. Charanrorō	207	"	0	"
8. Guarorai	827	"	13	"

In 1937, the total population of the entire island was estimated at 46,886, of which 42,688 were Japanese.

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain, etc.

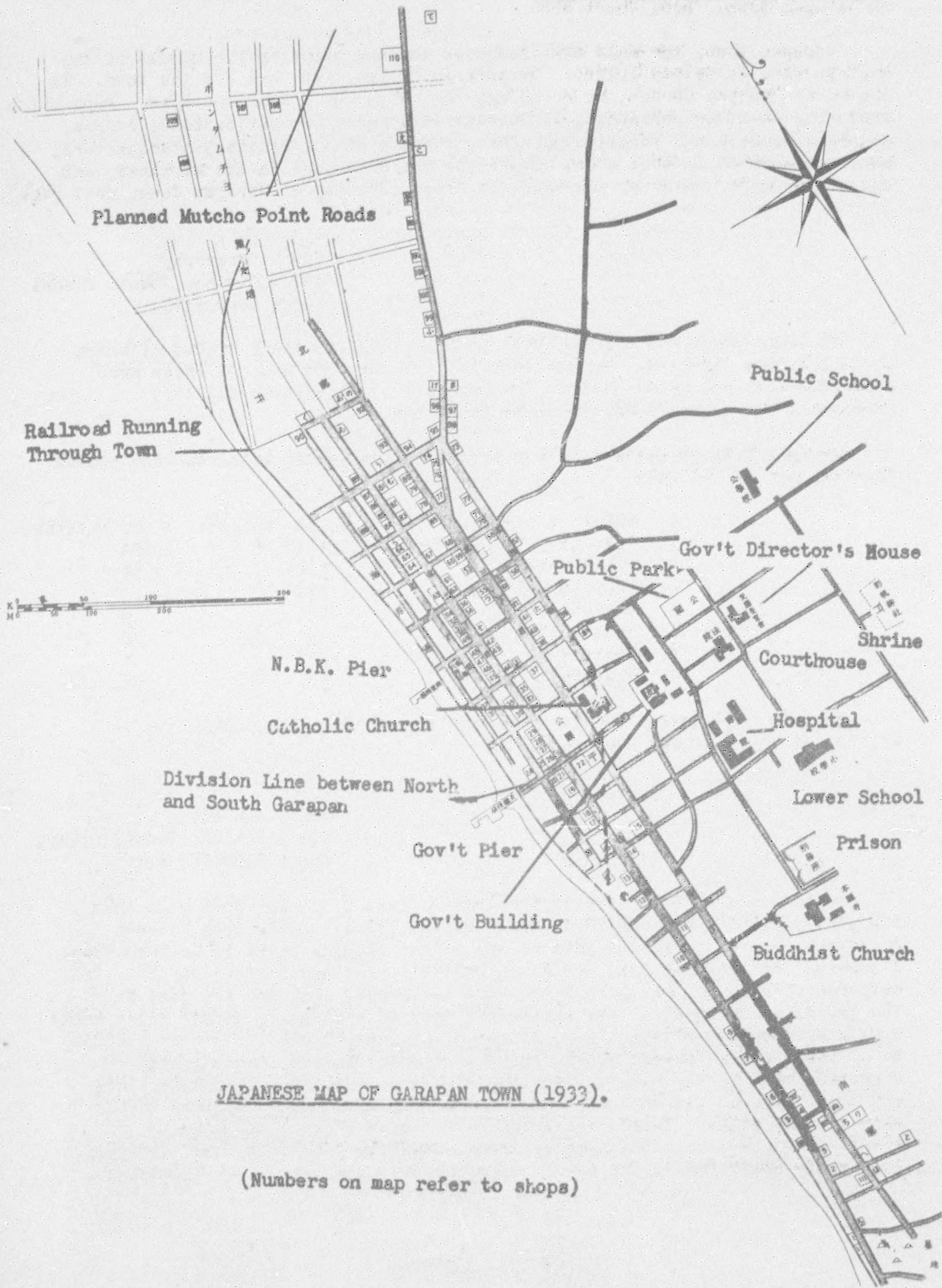
A barrier reef with several openings extends W. of Garapan, more than 500 yds. offshore, and continues up to Mutcho Point. Boats from Garapan Anchorage generally use the passage SW. of the landing piers at Garapan Town. A curving reef extends from the N. to partially enclose Tanapag Harbor. The entrance channel to this harbor is about 1,800 yds. long and 100 yds. wide. The ground at Garapan is low, rising eastward to a ridge of wooded hills whose crests are about 1/2 mile inland. To the N. of Garapan are cultivated fields. W. of the highway towards Mutcho Point is a small lagoon, about 1/4 mile in diameter, with marshy banks. The land at Mutcho Point and northward along the coast through Flores Point and past Tanapag is low and heavily wooded with coconut palms. There is a fresh-water brook about 2,500 yds. NE. of Flores Point, and a brackish-water creek about 750 yds. to the S. There is a long sandy beach facing the harbor S. of Tanapag Village. (See 601-130).

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600 - Geography
602 - Cities, Towns, Places

GARAPAN TOWN



JAPANESE MAP OF GARAPAN TOWN (1933).

(Numbers on map refer to shops)

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600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages, etc.

GARAPAN TOWN and TANAPAG HARBOR (Cont'd.)

Garapan Anchorage is an unprotected roadstead, untenable during strong westerly winds. It is in the lee from November to May, but subject to heavy swells. Its capacity is almost unlimited.

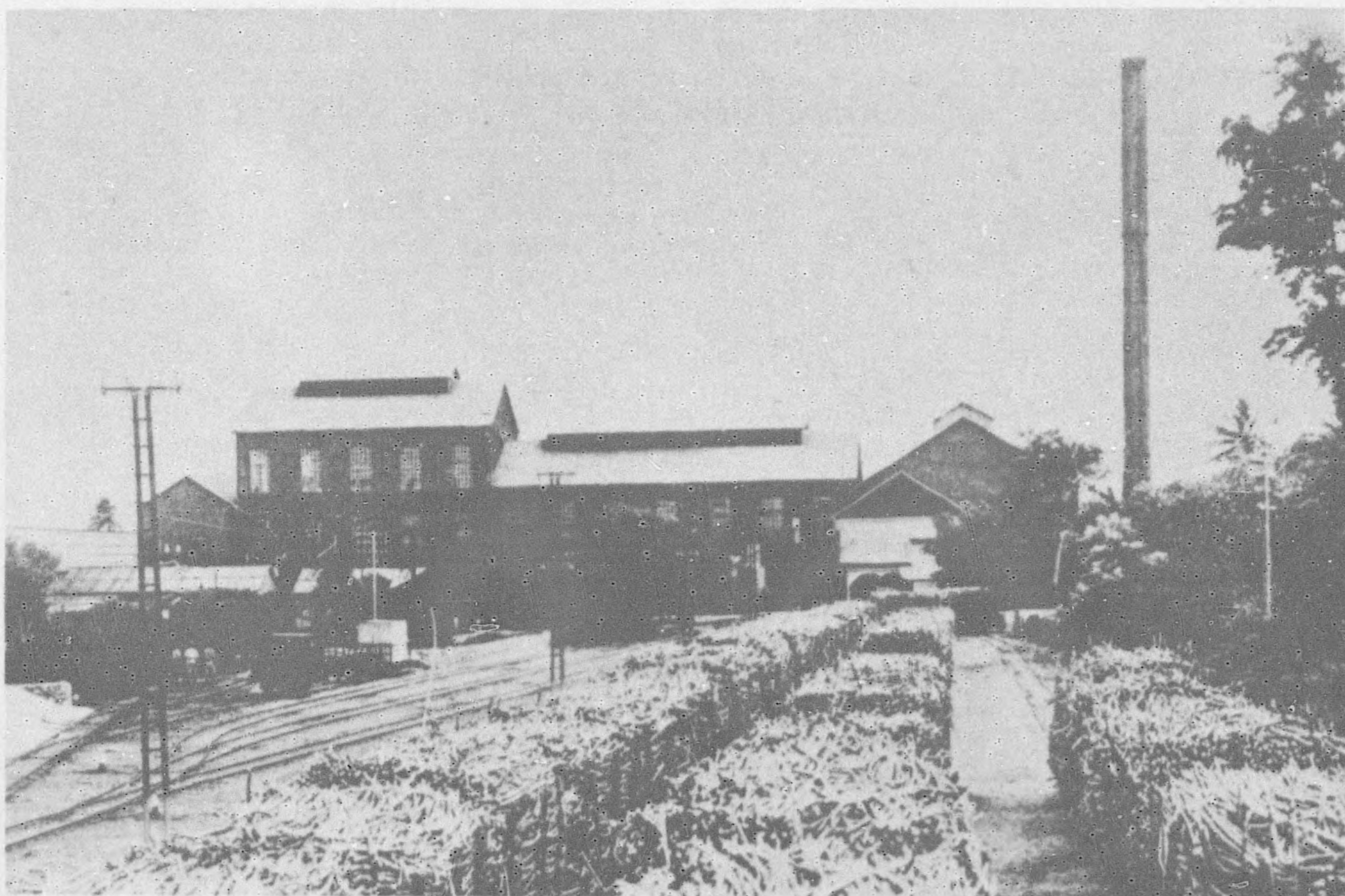
Although the channel through the reefs to Tanapag Harbor was narrow and shallow, there is evidence that the channel and basin have been dredged and improved. There is at least a depth of 25 ft. in the channel; this may have been dredged to 40 ft. A breakwater has been reported built over the reefs to Maniagassa Island. The harbor could accommodate at least 1 or 2 cruisers, as well as many smaller ships. It is well protected. Anchorage has been reported at 282°, 1500 meters from inner harbor #1 Buoy.

600 - Geography
 602 - Cities, Towns, Places
 500 - Tides, Currents, etc.

A current drives in through the channel between Saipan and Tinian, especially when the NE. winds are strong. The surf breaks heavily on the reef along the western side of the island. A weather station is located on the island.

600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

There are two main industries: copra and sugar. Saipan has the most important copra business in the Marianas. There are several sugar and alcohol mills with heavy concrete foundations.



SAIPAN ISLAND - Sugar refinery of South Sea Development Corp.

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600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

GARAPAN TOWN and TANAPAG HARBOR (Cont'd).

A fishing industry has been built up - tuna and bonita are the chief catches. The main export products are sugar, dried bonita, alcohol, tapioca starch and copra. The Japanese are said to have started mining of high grade manganese ore (80 - 90%) on Saipan. The extent and production of these operations are unknown. All industry and commerce is more or less government owned or controlled. Rice is imported. All trade has been with Japan. There are no banks, and monetary circulation has been in the hands of the Post Office, produce associations, mutual finance associations and money lenders. The plantations are located in the Aslito region in the southern part of Saipan, just N. of the town of Laulau on the E. central side, and in the Marpi region along the north western coast above Tanapag. There is a large sugar mill at Charan Kanoa, N. of Agingan Pt.

600 - Geography
 602 - Cities, Towns, Places
 700 - Gov't. Plants

There is a radio station at Garapan, seaplane shops and hangars at Tanapag Harbor, and a submarine base with facilities at Laulau Bay on the eastern side of the island. A branch Air Arsenal reported located on Saipan in late August, 1943. British sources reported in February, 1943, that there may be two floating docks at Tanapag Harbor, one capable of handling destroyers and the other capable of handling cruisers up to 10,000 tons. No confirmation of this.

600 - Geography
 602 - Cities, Towns, Places
 900 - Electricity, Gas, etc.

There is a lighting system on Saipan. In 1932, 4 electric generators were owned by the sugar mills on Saipan and Tinian. The radio power plant consists of three 75-kw. generators, but there are probably other generators to supply the telephone and lighting systems and the cable to Tinian.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

Rice is imported, but fish are plentiful. There are limited supplies of potatoes, taro, beef, poultry, coconuts, breadfruit, limes, wild deer, wild hogs, goats, peanuts, maize, bananas, pineapples, mangoes, etc. There is a large supply of sugar. An ice plant is located at Garapan, capacity unknown.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply

Rain water is the chief source, each house having its own small collecting tank. A water works was reported under construction in 1939. The railroad has several wooden water tanks with rain sheds over them, each tank having about 3,000 cubic feet capacity. A fresh-water brook is said to be located NE. of Flores Point. Another brook S. of this point is brackish. There are several water barges and tugboats used to supply water to ships.

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600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

GARAPAN TOWN and TANAPAG HARBOR (Cont'd.)

In peacetime, the N.Y.K. maintained regular schedules between the islands and Japan. The N.Y.K. Eastern Line called at Saipan 20 times a year, the Western Line 40 times, and the Saipan Line 48 times. In addition, inter-island schedules were maintained by N.B.K. ships. There is no information on present schedules.

600 - Geography
 602 - Cities, Towns, Places
 1300 - Railroads

There are about 53 miles of railroad track on Saipan, encircling the island except for about a 3-mile space on the eastern coast. The railroad is owned by the N.K.K., and was built primarily to connect the sugar plantations with Garapan and the sugar mill. The gauge has been reported as 26" and 30". A third rail has been reported added along the western coast, so that large flat cars and boxcars as well as small ones could be used. However, only narrow-gauge locomotives were seen. The locomotives seen in 1936 weighed from 10 to 20 tons and burned coal. In 1931 there were 11 engines and 300 cars. There are coaches for use of passengers.

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Facilities

The seaplane base is located at Tanapag Harbor. Hangars, full facilities. (See 601-1400, 603-300.)

600 - Geography
 602 - Cities, Towns, Places
 1600 - Wharves, etc.

There are 2 small piers at Garapan suitable for lighters and small boats. One is a concrete government dock 106 x 35 ft. with 2½ ft. of water alongside at low tide. The other is a N.B.K. pier, 60 x 35 ft., with 3 ft. of water at the end at low tide.

At Tanapag Harbor are 2 large concrete piers about 1,000 yds. E. of Mutcho Point. These are estimated as between 1,000 and 1,500 ft. long, with 28 ft. alongside. Both have 4-track, narrow-gauge railways and ballards. One of the piers is reported to have a 5-ton crane. There are 2 new warehouses. One of the piers has a rectangular stone wharf, 225 ft. long and 120 ft. wide at the outer end.

There is an L-shaped quay in the eastern part of the harbor. A small jetty is about 500 yds. NE. of the quay.

600 - Geography
 602 - Cities, Towns, Places
 1700 - Harbor Craft

Several tugs have been observed at the wharves.

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600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

GARAPAN TOWN and TANAPAG HARBOR (Cont'd.)

There are at least 2 radio transmitting stations and one receiving station in the Garapan vicinity. Two 400-ft. radio towers are close to the Garapan-Laulau road and are visible from Garapan anchorage. Three 100-ft. radio towers on the E. side of the hill in direct line with the government dock and Government House. There is HF/DF equipment. The receiving-set control rooms are in the 2-story concrete telegraph and post office building on the main street of Garapan.

There is a visual searchlight communication system between Saipan and Tinian.

There is a modern telephone system, with the exchange in the concrete building mentioned above. A cable connects the telephone systems of Saipan and Tinian Islands. (See O.N.I. #29, pp. 57-58.)

600 - Geography
 602 - Cities, Towns, Places
 1900 - Roads

In 1936 there were about 46 miles of roads over 6 ft. wide, and the condition of these ranged from fair to poor. The town of Garapan has wide streets paved with limestone. Roads extend through Garapan N. and S. along the W. side of the island, and to all main points. In 1940, about \$13,000 was appropriated for improvement and construction of highways on Saipan. All roads could probably be shelled from the sea.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

The houses at Garapan are mainly wooden, set close to each other and have stonework between them. Some have galvanized iron roofs.



GARAPAN TOWN: Broad roads and frame houses.

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Change #9
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600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

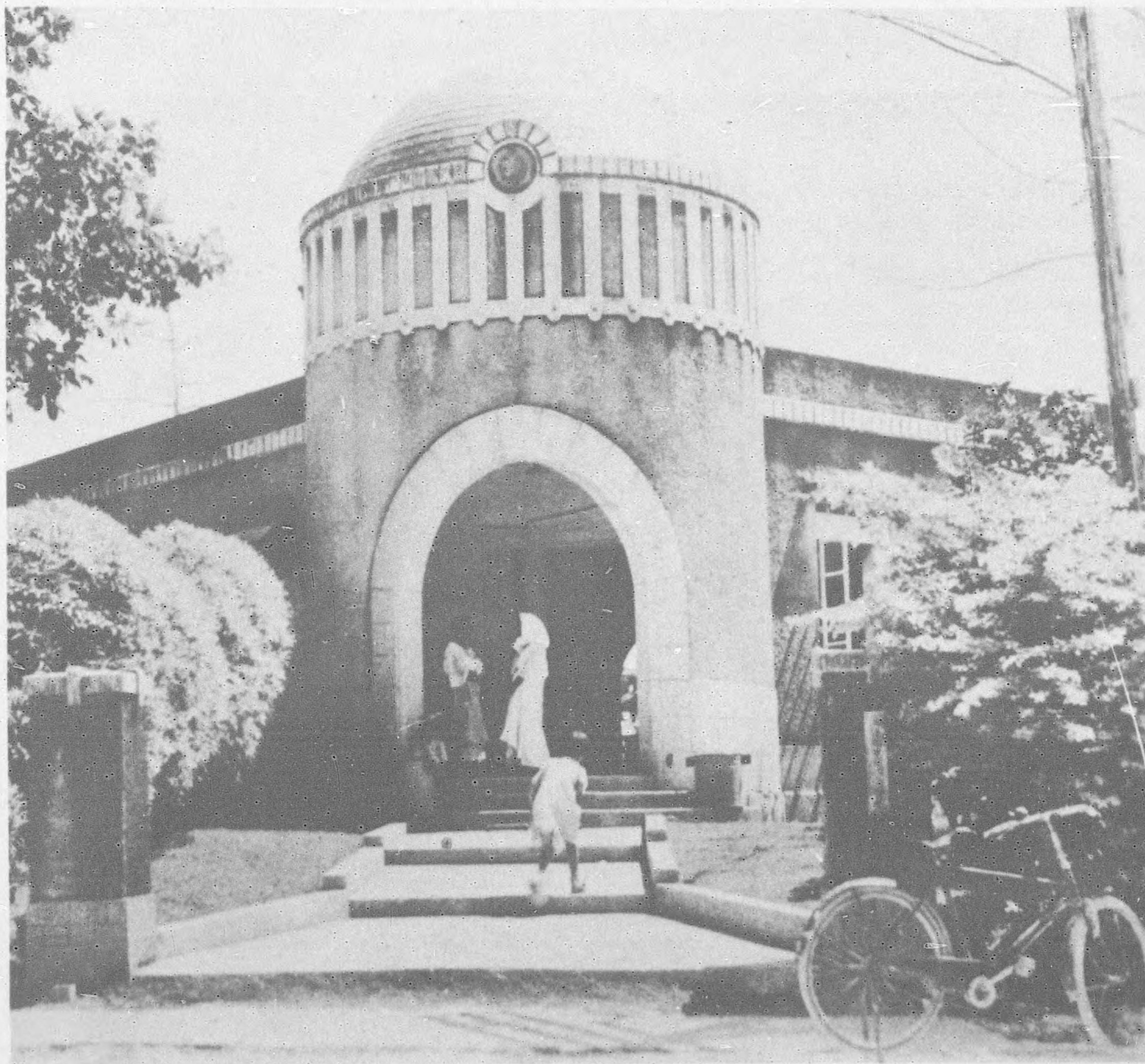
GARAPAN TOWN and TANAPAG HARBOR (Cont'd.)

The main buildings are: the government office building, the main administrative building, the court, hospital, post office and radio station building, the elementary school (for Japanese children), the public school (for native children), a public meeting house, about 8 warehouses, and concrete and steel barracks.

At Tanapag there are hangars, shops, etc.

600 - Geography
 602 - Cities, Towns, Places
 2100 - Health, Hospitals

The prevailing diseases are yaws, tuberculosis, dysentery, eye trouble. There are occasional cases of venereal disease, and a few isolated leprosy cases. There is a government hospital, with X-ray facilities and a staff of at least 5 Japanese doctors and some pharmacists and nurses, at Garapan. This was said to have a capacity of 372 patients (22 beds and 350 floor spaces. The sugar company maintains a small hospital of about 15 beds and one doctor on Saipan. There were three civilian Japanese dentists at Garapan a few years ago. Mosquitoes (not anopheles type), flies, bugs and fleas are numerous. Refuse disposal system is poor. There is no sewage system.



GARAPAN'S Japanese-built hospital.

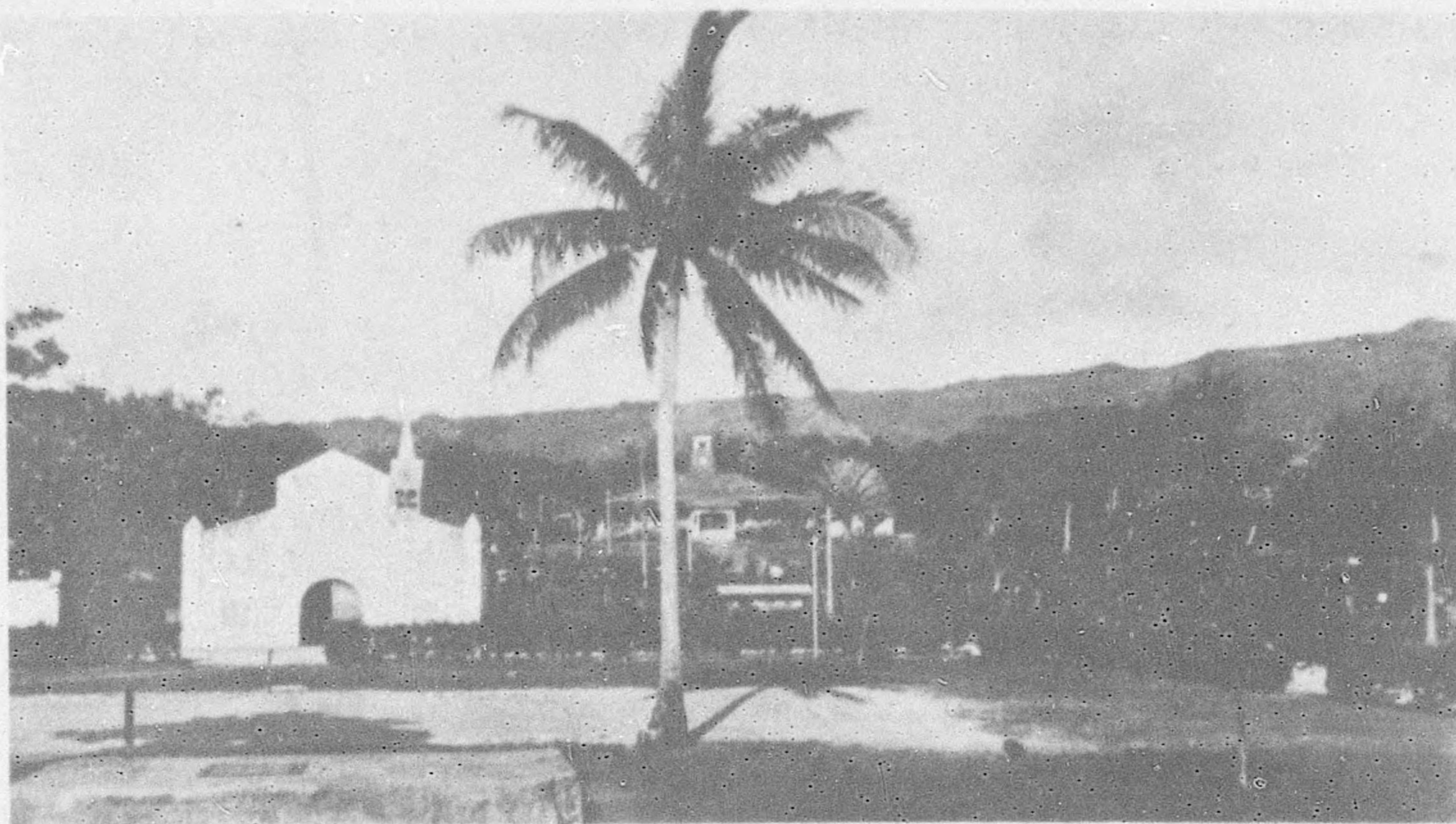
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600 - Geography
602 - Cities, Towns, Places
2200 - Local Gov't.

GARAPAN TOWN and TANAPAG HARBOR (Cont'd.)

Saipan is the seat of a branch bureau of the South Seas Administration. The Saipan bureau has under its jurisdiction all of the Marianas group.



GARAPAN: Church, Government house in rear and hills beyond.

600 - Geography
602 - Cities, Towns, Places
2500 - Important Persons

There are at least 2 natives, Mr. Gregorio Saublan and Vicente Ben Pangalinin, who speaks English.

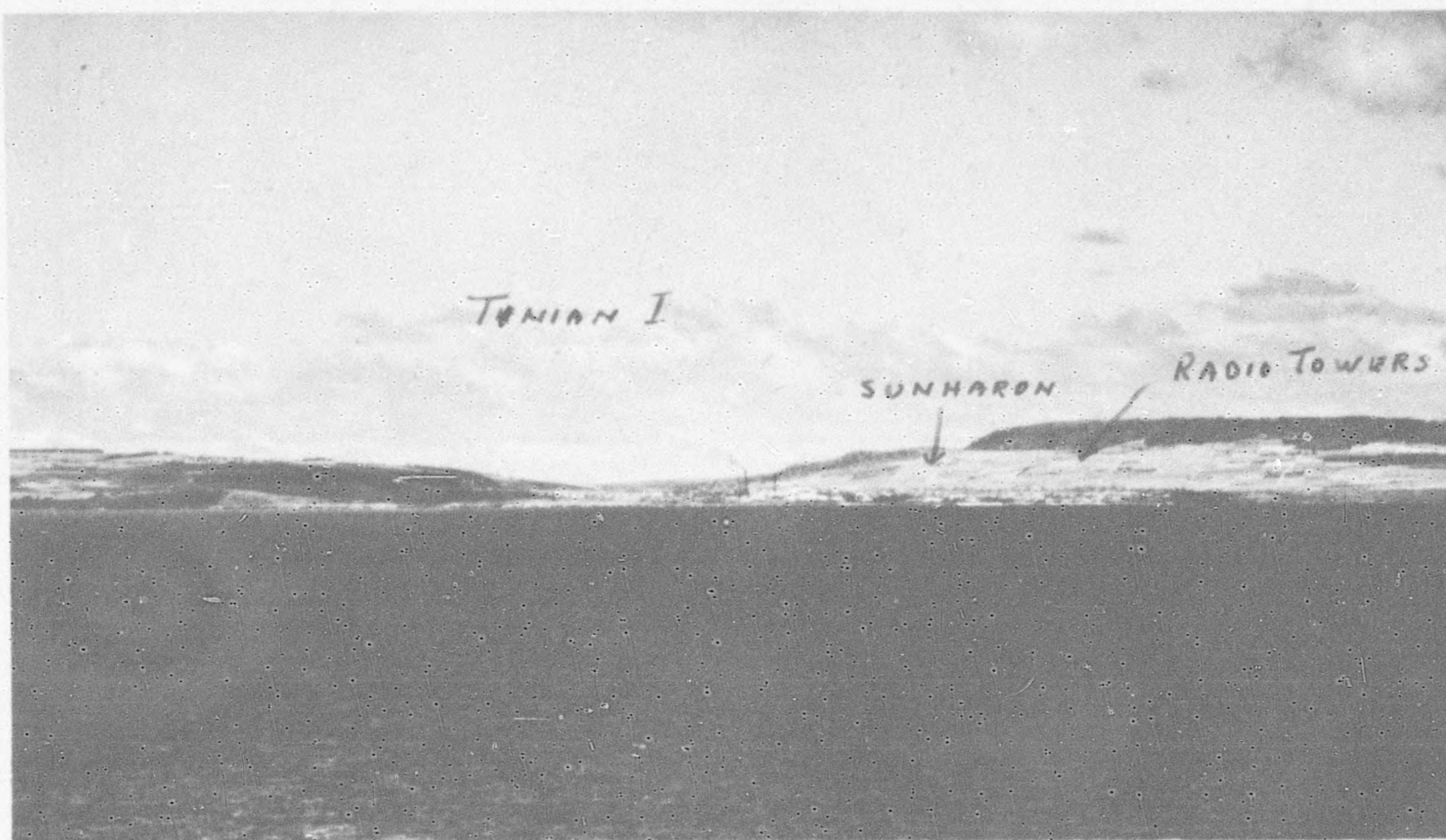
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Change #9
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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance

TINIAN TOWN and HARBOR - 14-58-00 N., 145-37-35 E. H.O. Chart 5359.
 (See Enemy sketch of island, next page).

There are many indications of the greatly increasing importance of Tinian Island rivalling the position of Saipan. Tinian and Saipan, separated by a narrow channel, actually form one large fortified base area, with installations and facilities complementary to each other. On Tinian is a major airbase, with full facilities and capable of handling bombers - however, its exact location is unknown. There are also anchorages for seaplanes, a ship anchorage, guns reported up to 16 inches, etc. Population is generally concentrated in Tinian Town, also known as Sunharon, on the southwestern coast.



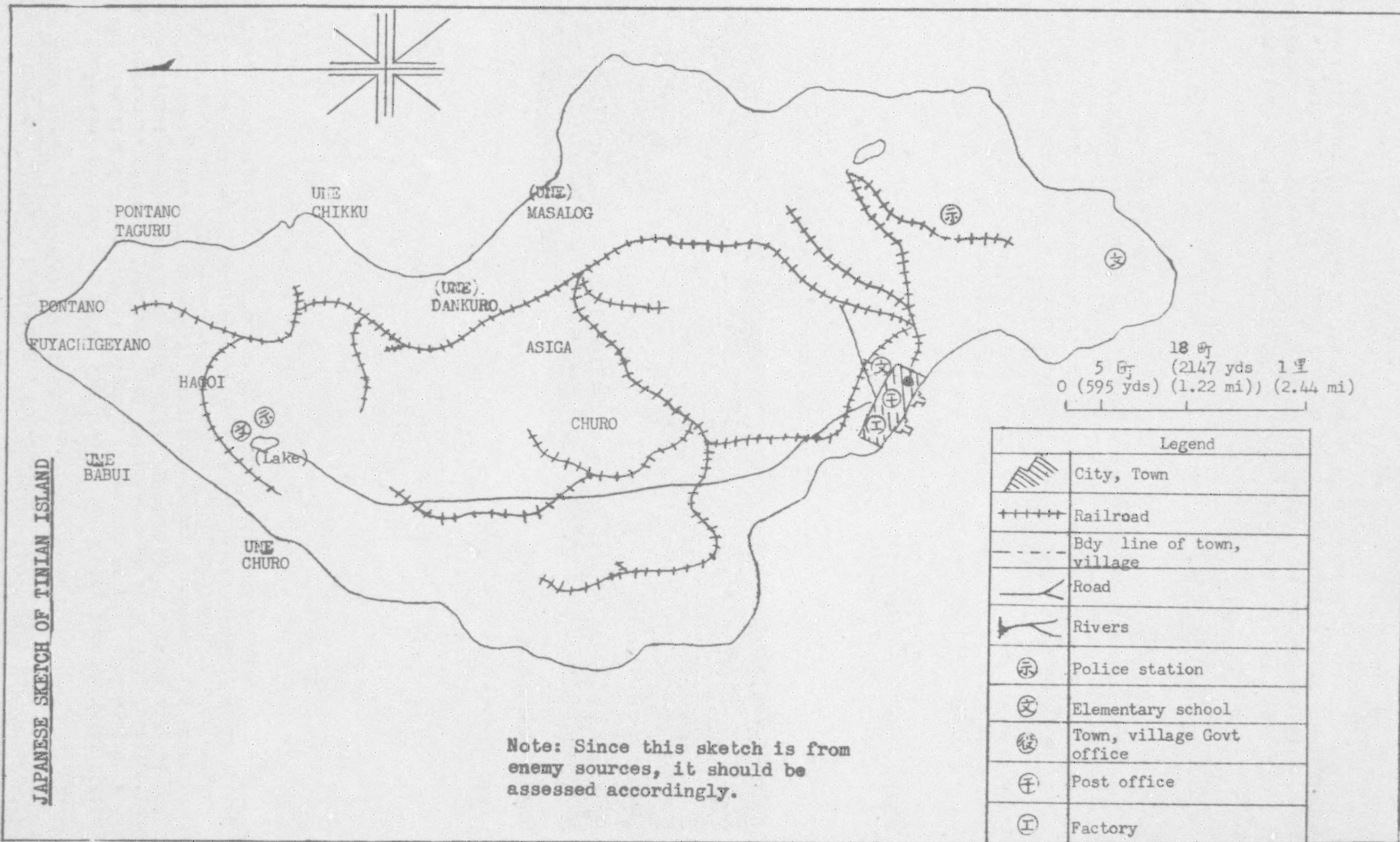
Town of Sunharon - Tinian I. (May 1939)

600 - Geography
 602 - Cities, Towns, Places
 200 - Population

Japanese figures list the population of Tinian Town in Oct., 1936, as 4,727, including 4,695 Japanese and 27 Koreans. Almost all of these worked on sugar plantations. Population of the entire island was 15,339. Under normal conditions, the town is a "sugar-town", with all main activities centered around the production or refining of sugar. The population observed two quite distinct periods of activity and of rest each year. The period of activity was from about January to April, the time of harvesting the sugar cane and refining it. The period of rest was from about July to October.

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain

The land around the town is generally low, rising to the E. The town is located along the shore. To the N. of Tinian Harbor, is Gurguan Point; to the S., Lalo Point. There is a small lake on the island, exact location unknown, but possibly near the center of the island. (See 601-130).



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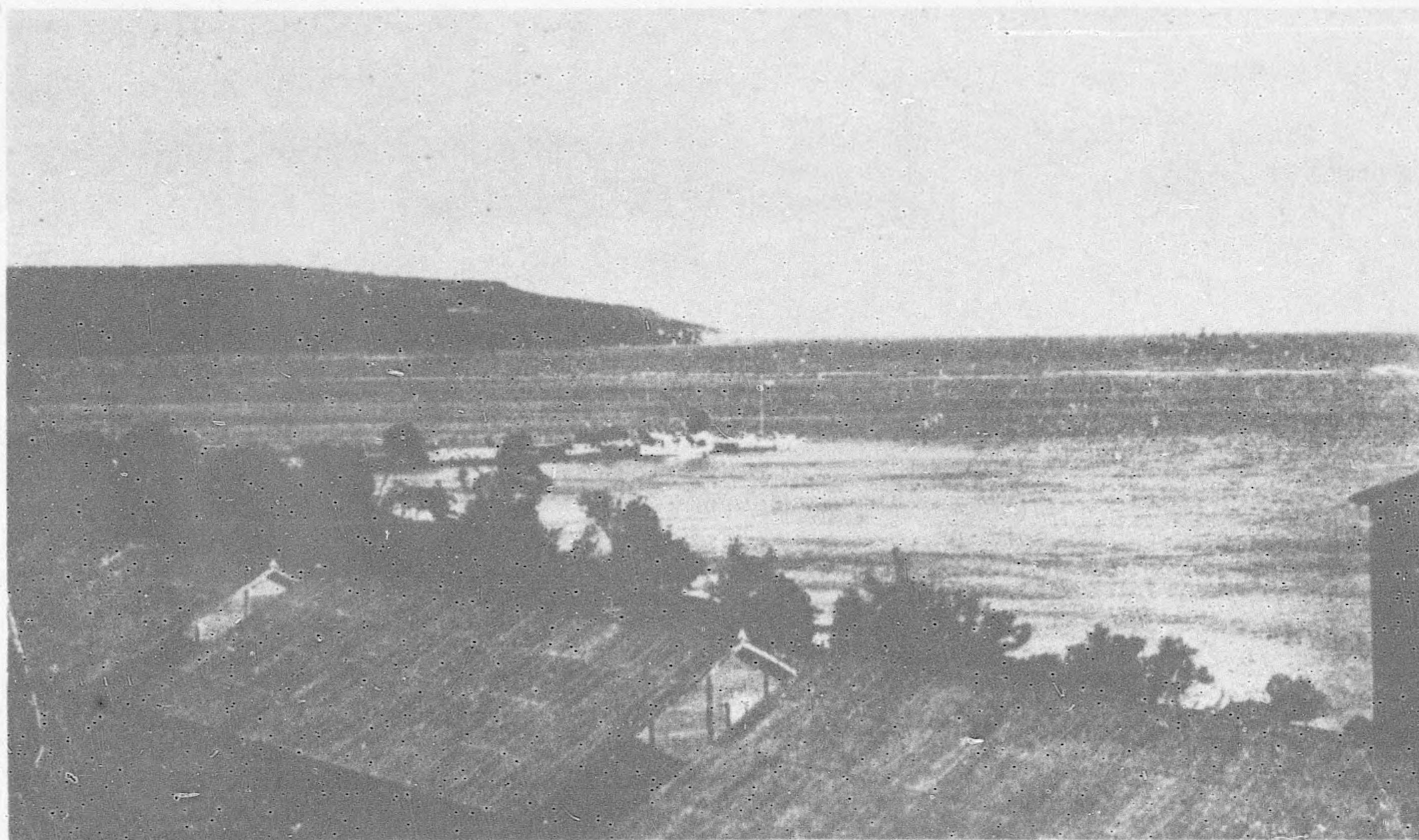
600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages

TINIAN TOWN and HARBOR (Cont'd.)

Tinian Harbor, or Sunharon Roads, has the only known anchorage ground. It is exposed from the W. to the S., so that during the SW. monsoon, from June to October, the water is rough and boating hazardous. The bottom is steep, and composed partly of coral rocks and partly sand over coral. About 16 500-yd. berths, in 30 fathoms or less, could probably be found along the shore.

The following specific anchorages have been used:

1. Bearings: Lalo Point 131°, center of Aguijan Island 204°, sand and coral, depth 22 fathoms.
2. Bearings: Lalo Point 132°, center of Aguijan Island 216°.



Distant View of Tinian Harbor.

600 - Geography
 602 - Cities, Towns, Places
 500 - Tides, Currents

The tidal currents in Tinian Harbor attain a maximum velocity of 1 knot. The flood current sets northwestward and the ebb southeastward, and they turn at about high and low water.

600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

The production of sugar is the main industry, most of the cultivated land on the island being devoted to this. There are two sugar mills located at Tinian Town, each having a capacity of 1,200 tons of sugar cane from which 120 tons of crude sugar is produced. The molasses by-product is converted into alcohol. The mills are said to have concrete foundations, and to be surrounded by sheds.

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600 - Geography
 602 - Cities, Towns, Places
 700 - Gov't. Plants

TINIAN TOWN and HARBOR (Cont'd.)

An air arsenal has been reported constructed here. See 602-1400.

600 - Geography
 602 - Cities, Towns, Places
 900 - Electricity, Gas, etc.

There are several electric generators on Tinian, some of them owned by the sugar mills. There is probably a lighting system for the town, at least. No details.

600 - Geography
 602 - Cities, Towns, Places
 950 - Fuel, etc.

Three oil tanks were observed in March, 1943, in Tinian Town. Some kerosene is stored. There are some coal stores.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

Because of the acreage accorded the sugar crop, food supplies are limited, and rice must be imported. Vegetables are plentiful from June to November, but scarce in the dry season. There are limited quantities of oranges, bread-fruit, coconuts, citron and guava. In 1935, there were about 6,000 to 7,000 head of cattle. Beef is pickled and dried. There are chickens, a few deer and goats.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply.

Small tanks are built on most houses to catch rainwater, for drinking purposes. There are about 26 wells in the town, but this water is unsuitable for drinking. Railroad water tanks, with a capacity of 3,000 cubic feet, are located at intervals along the tracks. The lake on the island is said to be fresh-water, but it is not known whether it can be used for drinking. In case of shortage, the sugar mill has a sea-water evaporating plant about the size of a ship's condenser.

600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

Before the war, Tinian was a regular port of call for ships of N.Y.K. The West-Round Line ships visited it 40 times a year and the Saipan Line 48 times. Saipan-based ships of N.B.K. visited it 12 times a year. In addition, there was a motor launch service between Tinian and Saipan.

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Change #9
 December 1943

600 - Geography
 602 - Cities, Towns, Places
 1300 - Railroads

TINIAN TOWN and HARBOR (Cont'd.)

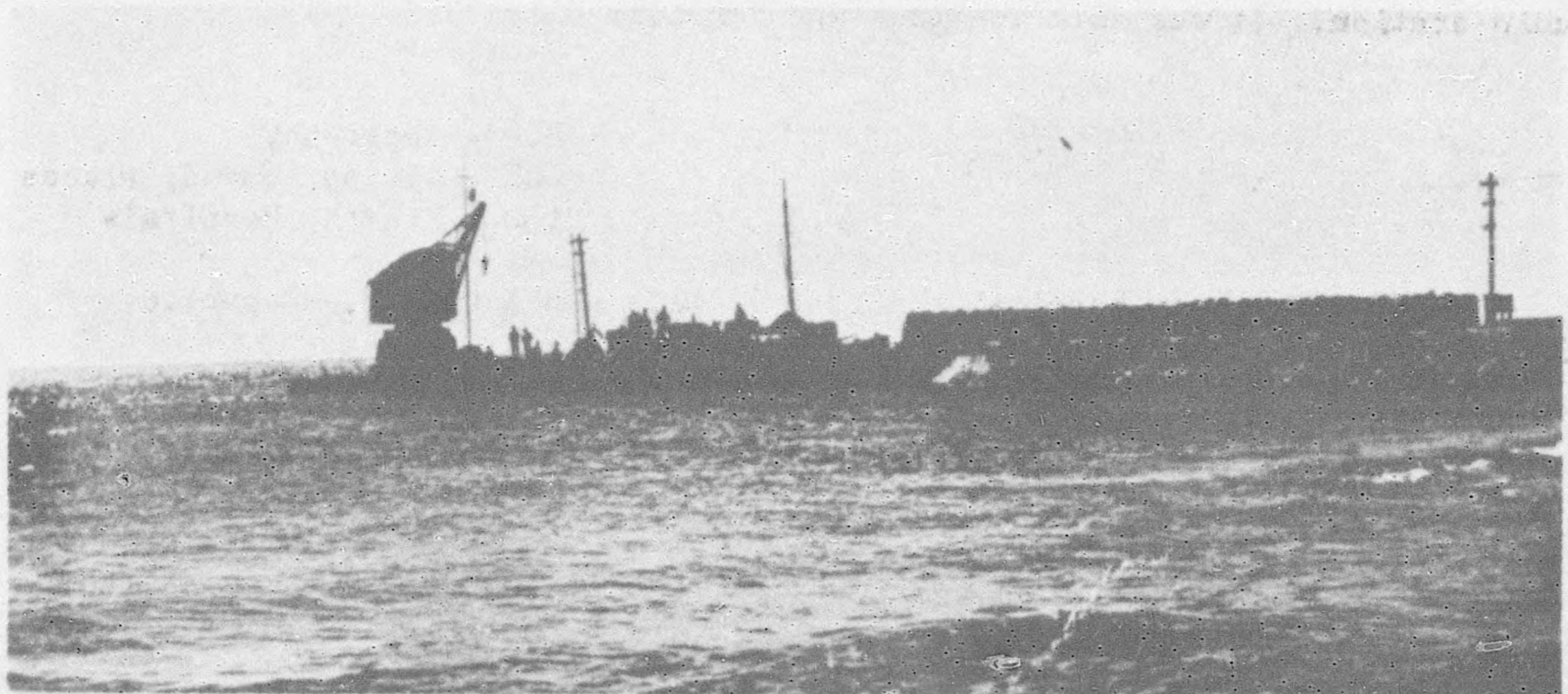
There were 49 miles of railroad on Tinian Island in 1936, built and used primarily to serve the sugar fields. Starting from the town, it practically encircles the island. Its gauge has been reported variously at 26 and 30 inches, but the latter is probably correct. There are some coaches for the use of passengers. (See Japanese sketch).

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Facilities

Emergency anchorage for seaplanes in Tinian Harbor. Another emergency anchorage is reported in the small lake on the island. A strong airbase, with paved runways and full facilities, is located on the island. Bombers have been flown from Japan to Rabaul, using Tinian as their only stop. Air routes are indicated in use from Tinian to Truk, Chichijima, Iwo, Satawan, Rabaul and Maug. An air arsenal is believed located here. Naval aircraft have used the route: Japan, Tinian, Kwajalein and Wake. (See 601-1400, 603).

600 - Geography
 602 - Cities, Towns, Places
 1600 - Wharves, etc.

Directly in front of the town is a 150-yd. long concrete pier used by tugs and lighters. There is a crane at the end of the pier, capacity unknown. Electric or telephone wires are strung along the length of the pier. The water is very shallow at the end, being less than 1 fathom at low tide. There may be another pier in front of the town, S. of the other. A landing pier, large enough to handle two vessels of 3,000 to 4,000 tons, is located in a cove E. of Gurguan Point.



View of Tinian Harbor Jetty (No date given).

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600 - Geography
 602 - Cities, Towns, Places
 1700 - Harbor Craft

TINIAN TOWN and HARBOR (Cont'd.)

There are tugs, lighters and fishing craft.

600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

There is a post office in the town. There is a small telephone system, connecting the plantations and the town, with the lines probably following the railroad tracks. This telephone system is connected with Saipan's by a cable. The radio station is located at the post office near the sugar mills. Two large radio towers are located at Tinian Town. Long-wave call letters are JPA; short-wave call letters JPB. There is a visual signal system between Tinian and Saipan.

600 - Geography
 602 - Cities, Towns, Places
 1900 - Streets, Highways

In 1936, there were few roads, and these were badly constructed. The total length was about 2 miles. However, there are indications that the road system has been improved, somewhat. About 10 more miles of dirt road were planned in 1936. These figures are for government-built roads, which allow at least passage for trucks.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

The two sugar mills are the biggest buildings, each being 4 stories high. Other buildings are the sugar mill hospital, the headquarters of the government branch bureau, the police station, post office, elementary school and the radio station. It was said the town was "thriving" in 1942.

600 - Geography
 602 - Cities, Towns, Places
 2100 - Health, Hospitals

The sugar company hospital includes 15 beds and 1 doctor. A public clinic is maintained.

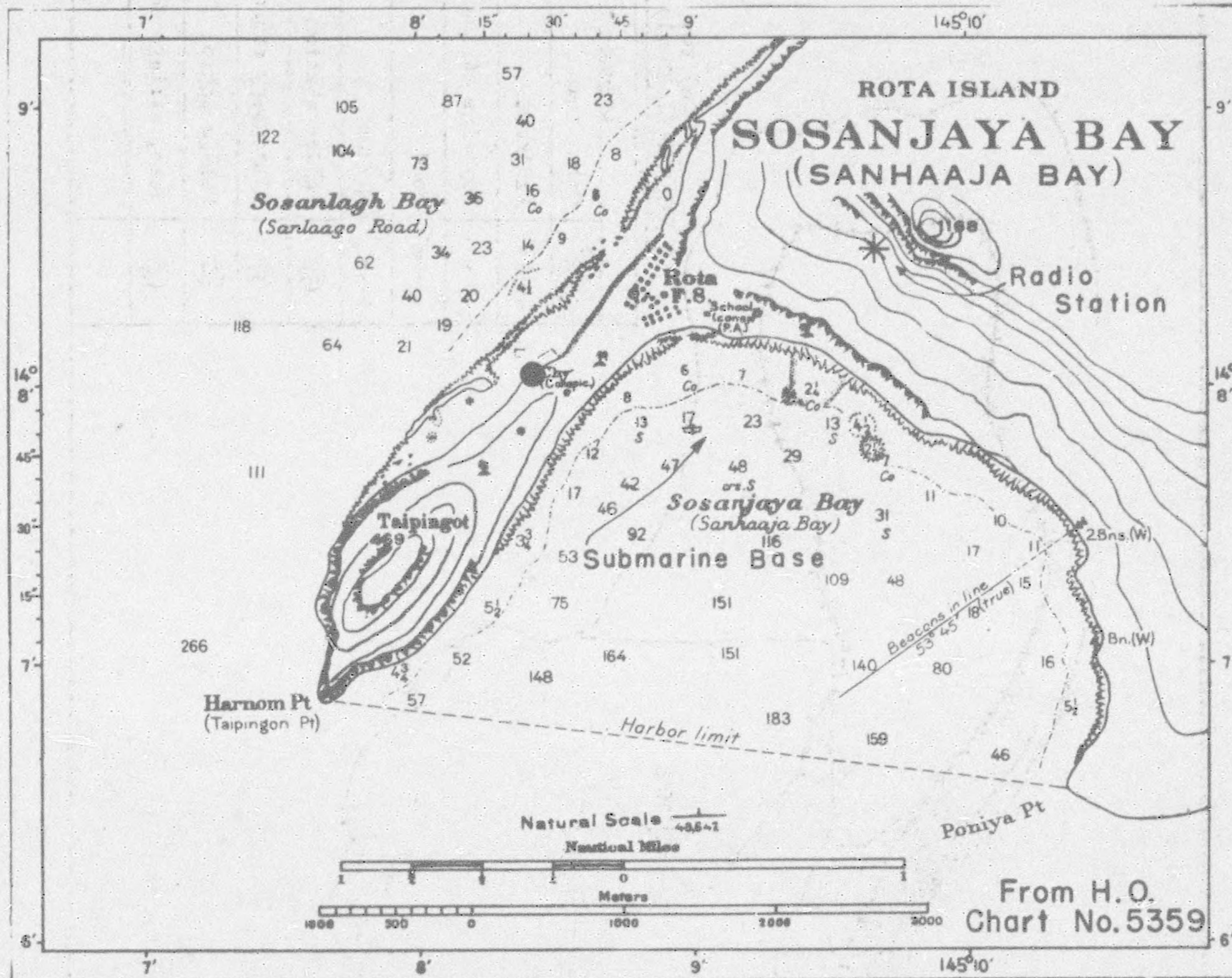
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 December 1943

600 - Geography
 602 - Cities, Towns, Places
 100 - Importance

ROTA VILLAGE, on Rota Island 14-08-20 N., 145-08-47 E. H.O. Chart 5359.
 (See Japanese sketch of Rota Island, following page).

Rota Island is the southernmost of the Marianas, lying about 32 miles NE. of Guam. A submarine base in Sosanjaya Bay has been reported. Emergency seaplane anchorage is available. Fortifications are probably present. U. S. submarine penetrated 1,200 yds. inside "harbor limit" line indicated on chart.



600 - Geography
 602 - Cities, Towns, Places
 200 - Population

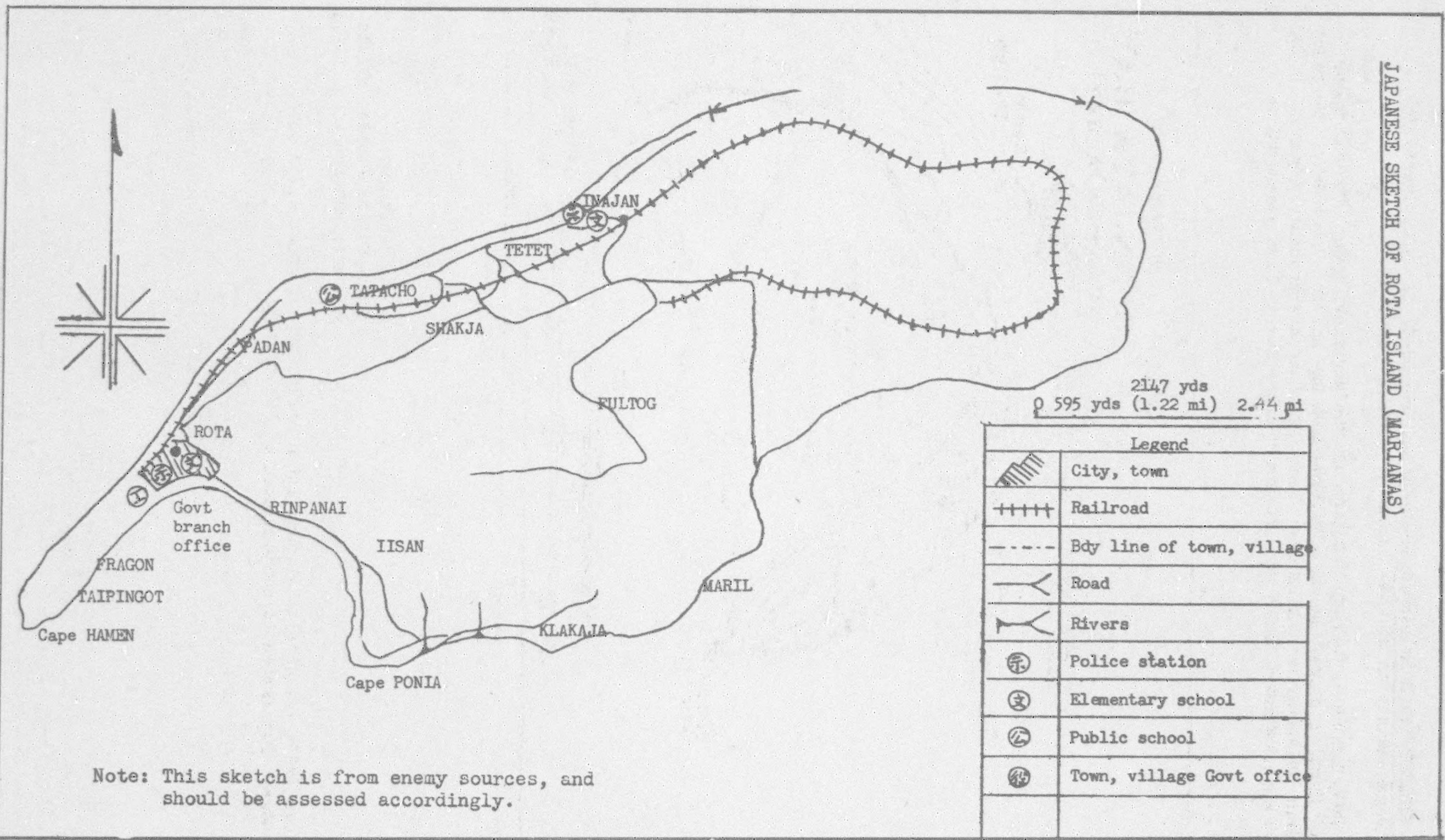
In 1936, island's total population was 5,590, of which 4,729 were Japanese. Population is concentrated at Rota Village.

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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance

JAPANESE SKETCH OF ROTA ISLAND (MARIANAS)



Note: This sketch is from enemy sources, and should be assessed accordingly.

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 December 1943

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain

ROTA VILLAGE (Cont'd.)

Rota Village lies on sandy ground at the neck of a narrow peninsula on the SW. side of the island. W. of the village of Sosanlagh Bay, SE. is Sosanjaya Bay. (See 601-130).



BEACH AT SOSANJAYA.

600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages

Anchorages are available in both bays on either side of the village. Vessels of at least 4,800 tons, 380 ft. in length can be moored in Sosanjaya Bay. (See O.N.I. 29, p. 47; H.O. 165, p. 563; also 601-130).

600 - Geography
 602 - Cities, Towns, Places
 500 - Meteorology

A weather station is located at Rota.

600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

Sugar is the main industry, with 2 sugar mills on the island. One, with daily capacity of 750 to 800 tons of sugar cane, may no longer be in use. The other, new in 1939, has a daily capacity of 300 tons of sugar cane. There are also plants for the production of alcohol. One of the mills is reported located about 3 to 5 miles SE. of the village at Sosanjaya Bay. The main mining industry in the Marianas is that of phosphatic Rock on Rota. Mining began in August, 1937. (See photo, following page).

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 December 1943

600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

ROTA VILLAGE (Cont'd.)



ROTA ISLAND - App. Lat 14°08'N. - Long 145°09' E.
 Loading sugar in barges. Crane at L. Islet across bay.

600 - Geography
 602 - Cities, Towns, Places
 900 - Electricity, Gas, etc.

At least 3 electric-power generators are reported on the island, one connected with the radio station, and 2 with sugar mills. A probable hydro-electric plant has been reported without confirmation under construction near the beach about 2 miles E. of Rota Village.

600 - Geography
 602 - Cities, Towns, Places
 950 - Fuel, etc.

Underground fuel stores for submarines reported.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

Rice is imported, although some is grown. There are small numbers of chickens and pigs. Several hundred cattle are pastured. Bananas, bread-fruit, mangoes and pumpkin are obtainable in season. Bamboo is plentiful. A small stream on the E. side of the island provides good water. Two or three wells at the village provide brackish water. Rainwater is collected in concrete tanks with capacities of 5 to 25 tons.

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600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

ROTA VILLAGE (Cont'd.)

N.Y.K. Saipan Line ships were on a regular schedule between Rota, Saipan and Japan. Ships of the N.B.K. Southern Inter-island line (Saipan, Tinian, Rota) called at Rota 12 times a year.

600 - Geography
 602 - Cities, Towns, Places
 1300 - Railroads

There are 22 miles of railroad on Rota, built by and for the sugar company. This runs from Rota Village along the western and northern sides of the island, making a wide loop at the northeastern end.

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Facilities

Emergency seaplane anchorage in Sosanjaya Bay. (See 601-1400, 603-300).

600 - Geography
 602 - Cities, Towns, Places
 1600 - Wharves

Information is limited, and there probably has been construction of additional wharfage facilities. A small-boat landing is reported in Sosanjaya Bay, and a small boat jetty is located at Sosanlugh Bay.

600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

A radio station is located on a small hill near the police station in Rota Village. A small telephone system probably exists in the village, and connects with the sugar mills.

600 - Geography
 602 - Cities, Towns, Places
 1900 - Roads

Roads were built around the island in 1937.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

Rota Village includes a police station, post office, church, school house, and dwellings. Many of the dwellings are built of bamboo. One of the sugar mills is 4 stories high, with concrete foundations. On the W. coast a "compact factory" was observed in May, 1943, and indicated as a good target for bombardment by submarine. Two new buildings were observed in May, 1943, at the head of the harbor.

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Change #9
December 1943

600 - Geography
602 - Cities, Towns, Places
2200 - Local Government

ROTA VILLAGE (Cont'd.)

Rota Island is under the jurisdiction of the Saipan Branch Bureau of the South Seas Government.



ROTA ISLAND -- Looking SW. from Rota Beach at
Harmon Point.

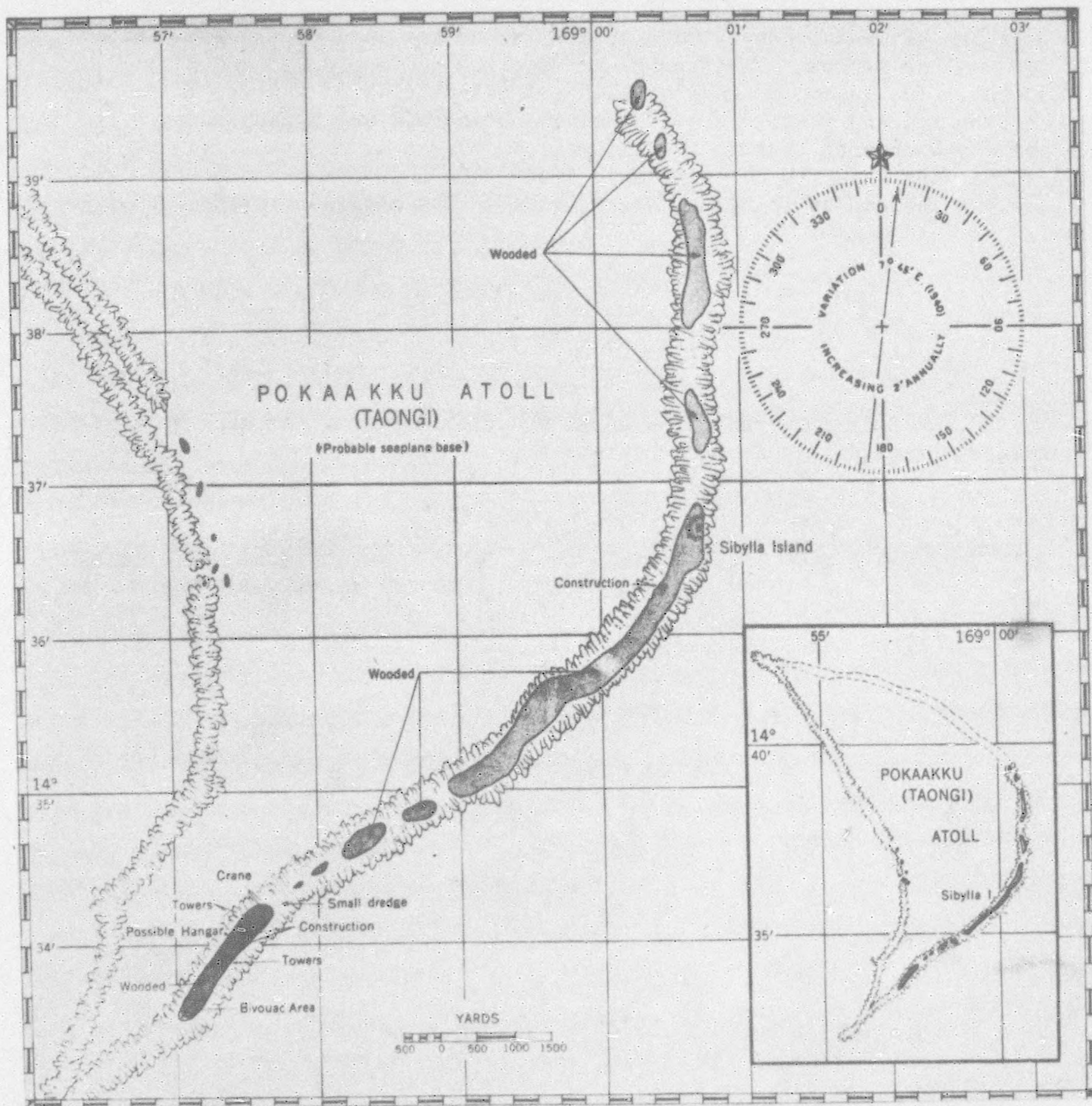
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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance, Features

POKAAKU SEAPLANE AIRPORT, Pokaaku Island - 14°36' N., 169°00' E. H.O. Chart 5427.

Pokaaku is the most northern of the Marshall atolls. It served as temporary flying boat and patrol base for Japanese operations against Wake at the beginning of the war. The seaplane airport is W. of Sibylla Island in the lagoon. There are reports of some developments and construction as indicated in Chart below. Due to lack of anchorage and inaccessibility to lagoon except for small boats enemy operations from here seem limited.



POKAAKU ATOLL, Based on H.O. Chart Jan. 1, 1943.

600 - Geography
 602 - Cities, Towns, Places
 200 - Population

There has been no report of any native population.

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600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain, etc.

POKAAKU SEAPLANE AIRPORT (Cont'd.)

Ten islands on the surrounding reef lie on the E. and SE. Sibylla, the largest, is about $2\frac{1}{2}$ miles in length, 300 yds. wide and lies on the SE. side. The islands are wooded.

600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages

Only one natural passage leads to the lagoon and with depth sufficient only for a motor launch. The passage is reported to be crooked and only 25 ft. wide. The lagoon is shallow with estimated depth of four to five fathoms over mud and there are coral heads and reefs. The Japanese may have cut a new channel through the SE. reef N. of the island at S. as cranes and dredges were observed here in March 1943. There is no good anchorage reported. A lee can be found off the W. side of the atoll during NE. trade winds.

600 - Geography
 602 - Cities, Towns, Places
 500 - Meteorology, Tides, etc.

During ebb tide a current of 6 knots or more is found. At high water the passage is not difficult to negotiate with boats.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions, etc.

There is fish, sea birds and ironwood. Waters infested with sharks.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply

Rainwater catchment.

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Fields, Commerce, etc.

Enemy information late 1941 and early 1942 had several flying boats and 3 patrol boats at Pokaaku. The landing area is in the lagoon on ESE. and S. parts. (See 603-300).

There is a report (19-4-43) of a landing field under construction on Sibylla Island. No confirmation. Observation in March and June 1943 showed a small hangar just N. of radio towers on southernmost island (see chart). There is a report (July 1942) that flying boats of the 17th Air Group were based at Pokaaku.

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600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

POKAAKU SEAPLANE AIRPORT (Cont'd.)

W/T: Four radio masts are located near the middle of island at SE. end of atoll. Four radio masts also N. end same island between the OBS. spot and signal tower NE. The OBS. spot at 14-34-03 N., 168-57-24 E. A weather observer is reported (1942). A second observation and signal tower is reported due E. from the OBS. spot cited above.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

The following buildings and constructions are reported or have been observed. On the island at SE. end of atoll:

4 radio towers

Central part:

small hangar N. of towers,
 repair shed N. of hangar,
 radio masts)
 signal tower) N. of repair shed.
 observation tower)

On Sibylla Island on the NW. side is a small shed. There is also a rectangular cleared space in from the beach on the NE. of Sibylla Island.

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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance, Features

WOTJE AIR BASE on Wotje Atoll - 09-27-42 N., 17-14-48 E.

Wotje Atoll is located in the central Ratak Chain. It is roughly oblong running E.-W. 26 miles and 11 miles in width. Most of the estimated 65 islands on the surrounding reef are located on the N., E., and SE. There is no land area on S. and SW. Wotje is developed as a strong advance base and is a good naval anchorage, submarine base, major air base for land and seaplanes. Together with Maloelap and Mille to the S. Wotje forms the outer eastern offensive and defense line screening the strong bases of Kwajalein and Jaluit to the W.

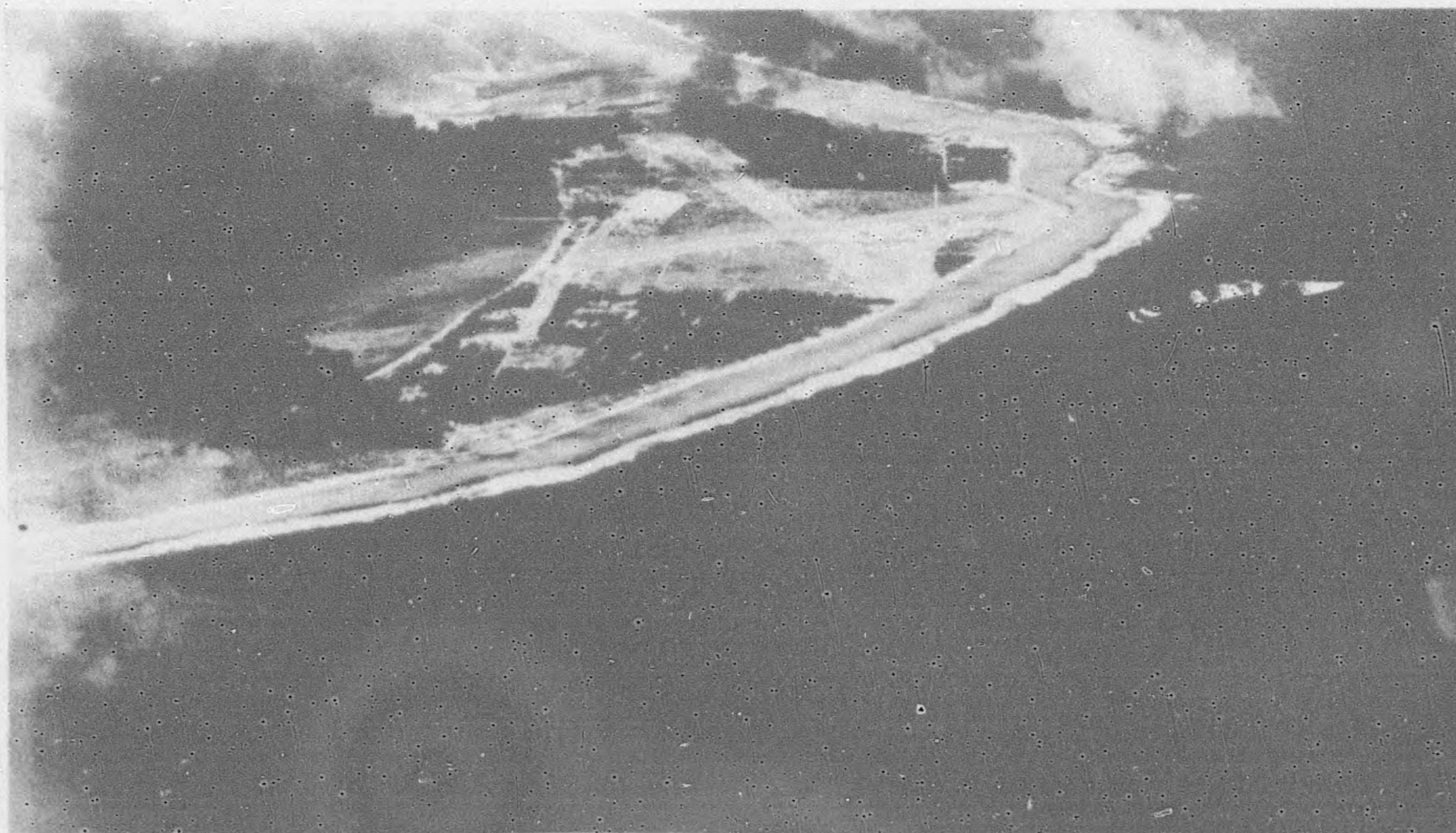
600 - Geography
 602 - Cities, Towns, Places
 200 - Population, etc.

Population of the atoll was estimated at 2500 in March, 1941. Ormed Island has a fair-sized native village concentrated on its lagoon side, population estimated at 1,000 (February, 1942). Wetowerakku, Meiehen, and Toton Islands are reported underdeveloped and uninhabited (February, 1942).

There is a report that in 1938 the natives were removed from Wotje Island and 1000 convicts imported to work on the construction of military facilities.

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain

Wotje is the principal and largest island on the Wotje Atoll, which is roughly oblong running E.-W. 26 miles and 11 miles in width. Most of the 65 islands on the surrounding reef are located on the N.E. and S.E. There is no land area on the S. and SW. Wotje Island is on the E. of the atoll, is crescent-shape, about 2 miles long and approximately 3/4 mile wide at maximum point. The island was covered with coconut palms, breadfruit and other trees. These trees have been cleared in many places for military installations and air fields. The soil is not suitable for cultivation. (See 601-130).



WOTJE ISLAND - App. Lat. 9°27' N - Long 170°14 E.
 Looking North.

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600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages, etc.

WOTJE AIR BASE (Cont'd.)

Of the three entrances to the lagoon Schischmarev Strait, called Toton Pass by the Japanese is the best. Located S. of atoll, minimum width 300 yards, 15 fathoms depth.

Lagediak Pass, a short distance to E. of Toton Pass, is about 100 yards wide with reported least depth of $2\frac{1}{2}$ fathoms. A strong current in the pass causes whirlpools. Use of this pass not recommended.

Rurick Strait, on the W. is 600 yds. wide at narrowest point with charted depth of 20 fathoms in midchannel. Three-fathom shoals on either side are reported to limit the channel width to 500 yds. for larger vessels. Nearest pass to anchorage at Christmas Harbor. There is an opening $\frac{3}{4}$ of a mile wide NE. of Wetowerakku Island. There are no recorded depths and ships using this pass must use great caution.

There is no information regarding possible mining of the passes or use of submarine nets.

600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages, etc.

The entrances on the S. of the atoll were being covered by patrol in Jan. 1942 and a shore listening station may be located at Wotje Island.

The lagoon appears to provide anchorage for a large fleet. As many as 9 enemy vessels have been observed in the lagoon at the same time, four or five of which were 5,000 ton merchant ships. However, it is incompletely surveyed and rocky heads and shoals are a danger.

There is an anchorage area W. of Wotje Island used by the Japanese. See H.O. 165 for details.

There is anchorage off Ormed Island in 16 fathoms at 1200 yards. This anchorage is not recommended by the Japanese.

Christmas Harbor at the NW. end of the atoll provides a sheltered anchorage in 10 fathoms. Possible anchorages have also been reported off Goat Island and ST. of Bird Island.

600 - Geography
 602 - Cities, Towns, Places
 500 - Meteorology, Tides, etc.

Temperatures range from 78 to 85 degrees F. There is small variation in temperature or atmospheric pressure. NE. trades prevail from Dec. - April. From May-Nov. winds from the E. Westerly winds are rare. See 601-110, 120.

600 - Geography
 602 - Cities, Towns, Places
 700 - Government Plants

Wotje Island has a major land plane and seaplane base with full facilities and repair shops. See Section 603-300.

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600 - Geography
 602 - Cities, Towns, Places
 950 - Fuel, Petroleum

WOTJE AIR BASE (Cont'd.)

Oil fuel is stored in camouflaged tanks on S. tip of island. Underground gasoline storage is believed to be situated in the NW. part of the island, near the seaplane ramp. Exposed tanks are camouflaged.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

Because of its location, good anchorage and land area Wotje is probably a supply base of importance for the E. Marshalls. Local supplies are fish, breadfruit, pandanus. Pigs and chickens are limited.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply

Water supply is available from several wells. Suitable for drinking purposes after boiling. Tanks for rain water were observed near the landing field. It is reported that a fresh water well has pumping facilities to supply water to ships.

600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

The Eastern Line of N.B.K. called about 16 times a year; trading schooners call intermittently and Japanese warships frequently. All freight is lightered ashore in barges of 50 tons' capacity.

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Fields, Commerce, etc.

Wotje is major advance base for both land planes and seaplanes. See Section 603-300 for details.

600 - Geography
 602 - Cities, Towns, Places
 1600 - Terminal Facilities

Only three piers are definitely identified. All three of these piers extend from the leeward side of the island into the atoll lagoon. This is quiet water, but no large ships have been actually seen alongside these piers; the water on this shore appears to be too shallow for deep draught vessels. It is presumed, therefore, that these three piers are used for small boats, barges and lighters. The piers are located as follows: the northern pier appears to be of concrete; it extends from the seaplane ramp, into the atoll lagoon, with a length of 400 ft; the second pier extends W. from a point parallel with the southern edge of the concrete plane apron into the water a distance of 500 ft., with an L-shaped western extremity; the third pier extends into the lagoon from a point S. of the southwestern turn-around, has a tapered shape, and is 150 ft. long. A pier-like projection on the

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AREA M - MANDATES

Change #9
 December 1943

600 - Geography
 602 - Cities, Towns, Places
 1600 - Terminal Facilities

WOTJE AIR BASE (Cont'd.)

third islet NW. of Wotje extends from the northern shore less than half the distance across the channel. It may be a bridge-head under construction or possibly a submarine fueling dock since a fuel tank and several buildings are on the islet.

According to the chart, landings could be made on the western shore of Wotje and on many other islands on the lagoon side, at high tide.

600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

Radio - A powerful radio station, built in 1936, with a night range of over 1200 miles, is located at 9-28 N., 170-15 E.; the station has two 150 KW generators, one 84-ft. mast; it communicates with Saipan, Jaluit, Truk, and Japan. Its location may have been shifted to the SW. part of the island by the February, 1942 raid. Three radio towers and a communications (probable) building were reported within the SW. tip of Wotje; towers may serve also as observation posts and fire control towers.

There is a report (3 Aug. 43) of 4 new stick masts 110' high.

Observation Posts - There is a meteorological station at the airfield. Several lookout towers have recently been erected -- see Radio. A lookout tower or water tank was reported on Rue Island at 9°23' 45" N., 170°09' 50" E., in March, 1942. Towers have also been reported on Goat Island and adjoining islands. There are searchlights on observation towers.

600 - Geography
 602 - Cities, Towns, Places
 1900 - Streets, Highways, etc.

Roads - A belt road inland roughly parallels the perimeter of Wotje Island, and has small roads leading inboard for access. A small causeway has been observed leading from the N. end of Wotje Island to the three small islands immediately to the N. (See Chart 603-300).

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

Wotje Island has been made into a military settlement. The following buildings and construction are on the island according to latest information:

storage tanks for water
 storage tanks for gasoline and oil
 2 areas officers' quarters
 commandants' building
 administration group
 10 assembly and repair shops
 4 hangars for land planes
 1 hangar for seaplanes
 9 barracks
 garage
 storehouses

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600 - Geography
602 - Cities
2000 - Buildings

WOTJE AIR BASE (Cont'd.)

pumping station
radio towers
radio masts
Large communication building L-shaped
observation and fire control towers
a large square building with open court
unidentified buildings

Location of most of the above buildings will be seen on Chart of Wotje Island. (See 603-300).

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Change #9
 December 1943

600 - Geography
 602 - Cities, Towns, Places
 100 - Importance, Features

TAROA AIR BASE on Maloelap - 08-42-46 N., 171-13-47 E. H.O. Chart 5428.
 (See Photo and Chart 603-300).

Taroa Island on the E. rim of the Maloelap Atoll is a major base for land plane and seaplanes. It is also an important fleet anchorage and temporary submarine base. Taroa is practically a military settlement with reported detachment of the Sixth Defense Force, Civil Engineering Unit, Detachment from Yokosuka Navy Yard and sanitary corps with medical officers. It is a key point in the Japanese eastern defense zone. There is a report that Maloelap Atoll lies 3 miles NW. of its charted position.

600 - Geography
 602 - Cities, Towns, Places
 200 - Population, etc.

In 1935 the population was reported to be 460 natives and 3 Japanese. There is a Protestant Church and most of the natives are members. The native population has probably been segregated in the smaller and less strategic islands of the atoll.

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain

Maloelap Atoll is in the central part of the Ratak Chain. It is irregular in shape running 32 miles NW.-SE. with a greatest width of $12\frac{1}{2}$ miles. Over 60 islands dot the surrounding reef. Kaven on the NW. and Taroa are the two largest. The islands are wooded with coconut and other trees. The soil is quite fertile. Enijun Island on the SW. side is rounded and higher than other islands.

600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages, etc.

Enijun is reported (January, 1942) to be the channel currently used by the Japanese -- the navigation hazards cited in H.O. 165 having probably been removed or buoyed. However, there are erratic currents off the entrance and a patrol is maintained. The fairway leading to Taroa Anchorage from this entrance has many reefs and may be unsuitable for larger ships. The course is 65° , somewhat N. of midchannel. This course passes a reef which lies in the extension of the long reef on the starboard side. The German ship, Condor, is reported to have entered this channel and steered a course of 54° for a distance of 6 miles, passing seven reefs to port at distance of from 400 yards to one mile. Another report states that a course of 62° through this pass leads clear of all dangers to Taroa Anchorage.

Torappu Channel is not charged but is wide and said to be navigable.

There is good anchorage in 6 to 15 fathoms off the W. of Taroa Island but not safe in W. winds. There is an anchorage exposed to NE. winds E. of Kaven Island in the lagoon 400 yards from a small islet. There is an anchorage in the lagoon off Airik Island about 120 yards in 8 fathoms. This anchorage is not good in W. winds. There is an anchorage inside Tjan Island but no specifications available.

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AREA M - MANDATES

Change #9
 December 1943

600 - Geography
 602 - Cities, Towns, Places
 500 - Meteorology, Tides

TAROA AIR BASE (Cont'd.)

There is a report of a strong S. set of the current off Maloelap, particularly strong 5 miles W. of Airik Island. Strong N. current close to shore between Airik and Taroa.

600 - Geography
 602 - Cities, Towns, Places
 700 - Government Plants

From July-December 1940 a German raider base was established at Maloelap. In 1942 considerable construction was reported in progress. It is probably used as a temporary submarine base. Little protection is afforded to ships from gun fire and there are many openings in the reef through which torpedoes could be fired. A guard division (armed merchant-men) was based at Taroa Oct. 1942 Branch air arsenal located here.

For Land plane and seaplane bases, see 603-300.

600 - Geography
 602 - Cities, Towns, Places
 950 - Fuel, Petroleum

There are oil fuel supplies stored on the island.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

There are supplies of coconuts, breadfruit, chickens and fish in limited quantity on the atoll.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply

Rain water catchment. Fresh water may be obtained from wells properly placed. In 1910 a well dug 2½ meters deep and 75 by 75 centimeters in cross section was the only one which gave fresh water.

600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

S. Seas Trading Co. ships based on Jaluit visited Maloelap 7 times a year.

600 - Geography
 602 - Cities, Towns, Places
 1600 - Terminal Facilities

Three piers are on the lagoon shore of Taroa Island. One elbow pier extends 375 ft. west into the lagoon, and then 160 ft. NW. Two finger piers, 170 x 215 ft. long, are on either side of the elbow pier.

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600 - Geography
 602 - Cities, Towns, Places
 1600 - Terminal Facilities

TAROA AIR BASE (Cont'd.)

A rude 165 ft. pier extends from the lagoon shore of Reuter Island. This island is connected with Taroa by a 700-ft. causeway.

A 435-ft. pier is on the SW. shore of Ollot Island.

600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

Radio: There is a radio station at the N. end of Taroa Island with 3 towers. There is a naval radio station on Ollot Island at 8°46' N., 171°10'48" E. This was reported hit in Feb., 1942, raid but may be restored. A report states that this station is on the first small island N. of Taroa, not on Ollot Island. It was bombarded on 8 May '43 at 5800 yds. range - radio towers at bearing 206 T. There was no opposition.

Observation Posts: Lookout towers and weather observer reported on Taroa Island. There is a tower on Enijun Island, almost hidden by the coconut trees.

Near center of Taroa lights and beacons have been observed. This may indicate night operations.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

There are more than 300 buildings on Taroa Island, as observed on Nov. 13, 1943; at least 40 of these have dimensions of 100 x 30 ft. or more. More than 10 of the buildings are heavily revetted. The principal concentrations of buildings are along the NW. shore, more than 60 buildings; along the lagoon shore, about 100 buildings; in the S. part of the island, more than 100 buildings; and on the E. shore, about 25 buildings. There are two large hangars, repair and supply buildings, etc. Other buildings are on Reuter Island, Ollot Island, and on unnamed islands just NW. of Taroa.

A report (Jan. 11, 1942) mentions 1500 cu. meters of building materials being sent to Taroa. It is reported (June '43) that barracks were being prepared for 500 men at Taroa.

600 - Geography
 602 - Cities, Towns, Places
 2100 - Health, Hospitals

Veneral and skin diseases common. Mosquitoes and flies said to be numerous.

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600 - Geography
 602 - Cities, Towns, Places
 100 - Importance

MILLE ISLAND BASE, on Mille Atoll, 06-05-00 N., 171-44-00 E. H.O. Chart 5429.
 (See photo and chart 603-300).

Mille Island Base forms the SE. anchor of the Marshall Islands defense and patrol zone. It is still in the process of active expansion of defensive works and air facilities. There is a well-equipped airbase; seaplanes can also be accommodated, in the lagoon A/A and beach defenses are being built up. The lagoon offers a fleet anchorage. Five fields lie within a 300-mile radius, ensuring rapid air reinforcement for any one of them and forming a compact and strong zone.

600 - Geography
 602 - Cities, Towns, Places
 200 - Population

The main, perhaps entire, population of Mille Island consists of the garrison forces. At least 2,500 to 3,000 men could be accommodated in barracks, and while there may not be this many based there yet, it is an indication of what may be expected. In 1935, 515 natives lived on the atoll.

600 - Geography
 602 - Cities, Towns, Places
 300 - Terrain

Mille Island lies at the SW. corner of the atoll. It is triangular in shape, and measures about 2 miles in length, by 1 mile at the greatest width. There is a small island at the SE. end of Mille, and joined to it by a causeway. Evidently the highest elevation on the island is about 15 ft. at the SW. point, and this slopes back towards the lagoon. The island has fairly thick vegetation, consisting of coconut trees, pandanus trees and scrub. (See 601-130).

600 - Geography
 602 - Cities, Towns, Places
 400 - Anchorages

See 601-130.

600 - Geography
 602 - Cities, Towns, Places
 500 - Meteorology

A meteorological station is reported.

600 - Geography
 602 - Cities, Towns, Places
 600 - Industry, Commerce

Copra, dried fish and fruit is traded for cheap Japanese goods.

600 - Geography
 602 - Cities, Towns, Places
 900 - Electricity

A probable generator plant was observed on Mille Island on November 5, 1943,

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600 - Geography
 602 - Cities, Towns, Places
 900 - Electricity

MILLE ISLAND BASE (Cont'd.)

in a partially revetted building, 55 x 30 feet, centrally located. Buried utility lines extend from the building to the strong points at the NW end of Runway "C" and the SW end of Runway "A". A buried line also extends from the generator to a water purification unit on the lagoon shore directly north of the northern barracks area. The purification unit is enclosed in a 110 x 35 feet building.

600 - Geography
 602 - Cities, Towns, Places
 950 - Fuel Storage

Probable fuel storage on the airfield. See 603-300.

600 - Geography
 602 - Cities, Towns, Places
 1000 - Provisions

Coconuts, pigs and chickens are numerous. There are limited supplies of breadfruit, papaya, bananas and potatoes. Tuna, mackerel and flying fish are abundant.

600 - Geography
 602 - Cities, Towns, Places
 1050 - Misc. Supplies

A torpedo replacement depot was reported at Mille on Aug. 9, 1943.

600 - Geography
 602 - Cities, Towns, Places
 1100 - Water Supply

Rainwater provides most of the fresh water supply. It is collected in cisterns and is apparently mixed with well water for drinking purposes. Drinking water is sometimes difficult to obtain from January to March, when there is little precipitation. Pits or wells located near the center of Burrh Island provide some fresh water.

600 - Geography
 602 - Cities, Towns, Places
 1200 - Shipping

Jaluit - based ships (a 1,000-ton steamer and a 500-ton auxiliary schooner) of N.B.K. called at Mille 7 times a year.

600 - Geography
 602 - Cities, Towns, Places
 1400 - Air Commerce

Airbase and seaplane anchorage. Air patrols operate from here. (See 601-1400, 603-300).

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600 - Geography
 602 - Cities, Towns, Places
 1600 - Terminal Facilities

MILLE ISLAND (Cont'd.)

Only small boats and lighters can use the known pier facilities. A pier of mole construction, about 335 ft. long and 50 ft. wide, extends into the lagoon over fairly deep water at the SE. side of Mille Island. A trapezoidal stone crib adjacent to the end of the pier indicates a possible future extension. There are also 3 T-shaped boat landings S. of the main pier.

600 - Geography
 602 - Cities, Towns, Places
 1700 - Harbor Craft

The following harbor craft were observed on Nov. 5, 1943, in the lagoon near the pier:

5 - 50 foot lighters
 3 - 35 foot lighters
 4 - 15 foot boats

In addition, a freighter and four lighters were reported outside the lagoon on the west side of the atoll. No large shipping was observed.

600 - Geography
 602 - Cities, Towns, Places
 1800 - Communications

Radio towers are located at the N. end of the island. As observed on Nov. 5, 1943, there are 8 stick masts located in a clearing near the north end of the island with a 65 x 35 feet revetted building directly NW. of them. These probably constitute the radio station. There is another mast, probably radio, close to the runways. Radar installations present. H/F D/F reported.

600 - Geography
 602 - Cities, Towns, Places
 1900 - Roads

A road, averaging 15-ft. in width and probably coral-surfaced, encircles the island. A 15-ft. wide causeway connects Mille with the small island at the SE. end.

600 - Geography
 602 - Cities, Towns, Places
 2000 - Buildings

There are more than 70 buildings on the island, most of them in 2 general groups along the lagoon shore. These consist mainly of barracks-type buildings, as well as service and storage buildings. A camouflaged building in the southern barracks area, with a mast in front of it, may be an administration building. One of the barracks in the northern area is camouflaged and also has 2 red crosses painted on it, indicating its possible use as a hospital. On the west coast of the island are about 18 buildings, most of them revetted, located near the west end of Runway "A".

On the small island at the southeast end of Mille Island are 2 buildings.