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ALLIED GEOGRAPHICAL SECTION

SOUTHWEST PACIFIC AREA

TERRAIN STUDY No. 50

AREA STUDY OF PORTUGUESE TIMOR

27th February, 1943

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IMPORTANT NOTE

AGS Publications were prepared of areas which were always behind the enemy lines at the time of publication. They represent the best information available at that date consistent with compilation to meet deadlines set by GHQ.

It is hoped that corrections and additions can be supplied by patrol officers, geologists, etc., who will be operating in the field. This information is particularly important in remote areas which have not been occupied by our own troops.

AGS—HQ AMF
15th Oct., 1945.

ALLIED GEOGRAPHICAL SECTION
IN CO-OPERATION WITH
DIRECTORATE OF INTELLIGENCE, A.A.F.
SOUTHWEST PACIFIC AREA
TERRAIN STUDY NO. 50
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AREA STUDY OF PORTUGUESE TIMOR

PART I: ENEMY STRENGTHS, DISPOSITIONS, INSTALLATIONS, ARMAMENT

SECTION I—NAVY

See Current Intelligence Summaries

SECTION II—ARMY

See Current Intelligence Summaries

SECTION III—AIRDROMES

1. General:

At present (February, 1943) the Japanese have three operational airdromes in the Island of Timor, viz., Koepang (Penfoei), in Dutch Timor, and Dilli and Fuiloro in Portuguese Timor. Although the Penfoei airdrome is by far the most developed of the three, the operational significance of Dilli and Fuiloro in relation to Australia is greater when it is realised that Dilli and Fuiloro are, respectively, 55 and 120 nautical miles nearer to Darwin than Penfoei.

Dilli and Fuiloro are the only known airdromes in Portuguese Timor. Dilli is operational for fighters and bombers and Fuiloro for fighters. It will, no doubt, shortly be fit for use by bombers.

2. Table of Distances:

Direct distances are as follows:—

	Nautical Miles.	Statute Miles.
Koepang to Darwin	440	515
Dilli " "	385	450
Fuiloro " "	320	375
Dilli to Ambon (Laha)	325	380
" Kendari	325	380
" Mandai	410	480
" Koepang	145	170
" Waingapoe	315	370
" Den Pasar	600	705
" Babo	580	680
Fuiloro to Ambon (Laha)	290	340
" Kendari	365	430
" Mandai	485	570
" Koepang	220	260
" Waingapoe	400	470
" Den Pasar	685	805
" Babo	520	600
Dilli to Fuiloro	85	100

3. Airdromes:

The location of airdromes and potential airdrome sites is shown on the map on page 2.

a. *Dilli* (8° 33' S., 125° 34' E.)—See Photos Nos. 1 and 2:

This airdrome is located on a level stretch of land on the north coast of Portuguese Timor, $1\frac{1}{2}$ miles (2 km.) west of the town of Dilli, and now consists of two prepared strips, one N/S, 1,290 yards (1,180 m.), and the other E/W, 1,250 yards (1,140 m.). This latter runway and the southern portion of the former are situated on ground to the south of the main coast road which formed the south boundary of the old Portuguese airdrome area and constitute an extension by the enemy. Further extension of the N/S runway to the South appears possible.

It may also be possible to extend the E/W runway to the East by removing trees and houses. Extension to the West appears impracticable, as this would run out into the paddy fields, which are periodically flooded by the Comoro River. Coral and limestone surfacing material are available and have been used for repairing the runways.

The airdrome is between one and two miles ($1\frac{1}{2}$ km. and 3 km.) to the north of the foothills of a mountain range which rises to 6,000 feet (1,840 m.) approx. 5 miles (8 km.) from the site. There is open sea to the North and northeast. On all other sides the only obstructions are trees and native houses near the boundaries of the landing area. The topography of the foothills is such that a rather sharp turn is necessary in approaching from the southeast.

In the wet season, December to March, clouds with a base of 1,000 feet are common on the foothills of the mountain range.

Dispersal facilities are limited. The enemy appears to make use of a clump of trees along the eastern edge of the N/S runway and just south of the E/W runway and in the coconut plantations to the west of the old airdrome area. This latter area was used to disperse fighter aircraft seen on the field in March and April, 1942.

The prevailing wind in the dry season (April to November) is from the northeast, and in the wet season (December to March) is from the northwest.

Communication with Dilli town is by the main coast highway and by the old Dilli-Aileu road, each of which, in this area, is a good M.T. road.

Beach landings can be made about $\frac{3}{4}$ mile (1 km.) to the west of the airdrome, which is then approached through coconut and banana plantations between the coast and the main road. A.F.V.'s may approach through this area with fair cover.

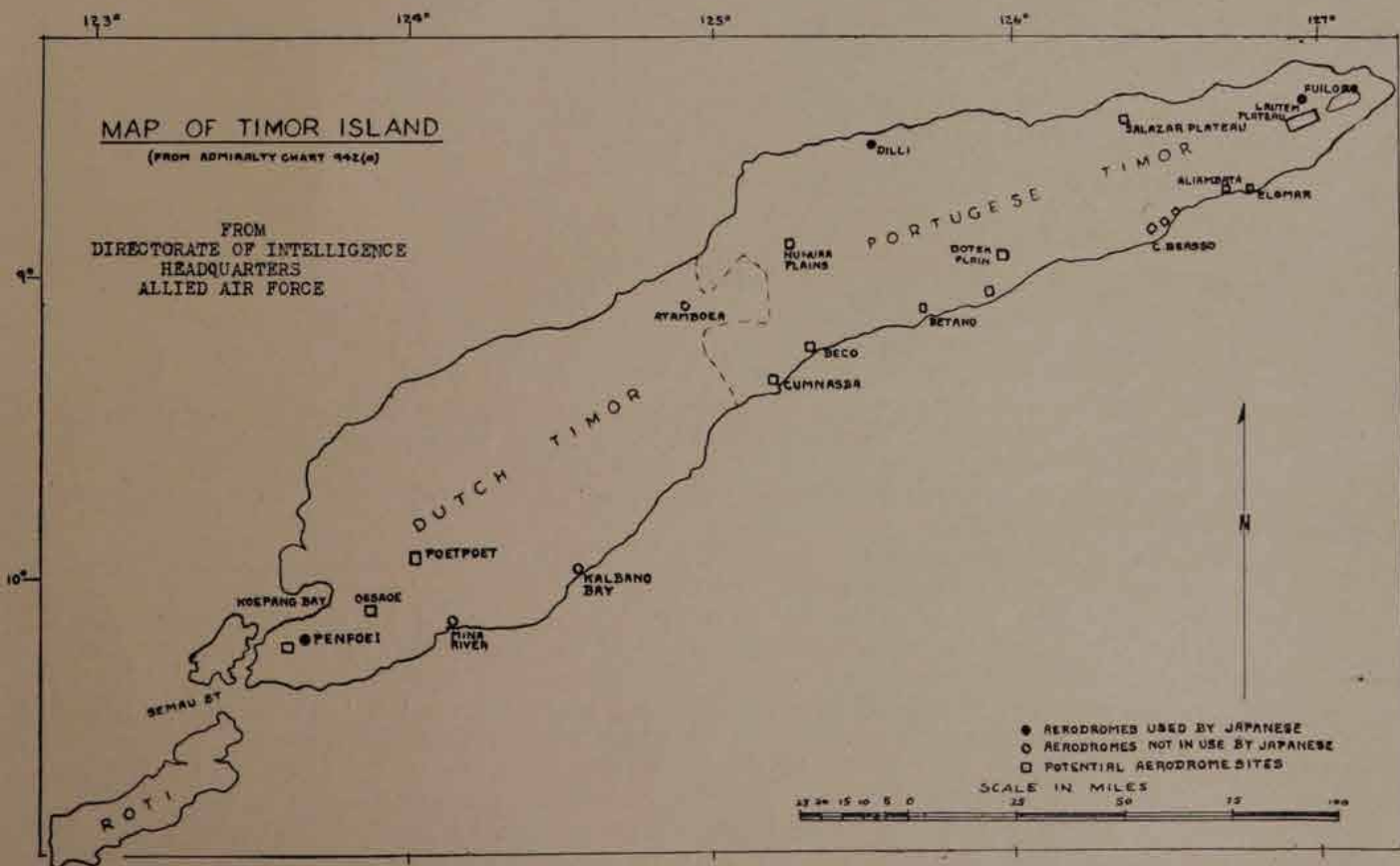
Both Australian and Japanese troops have already landed on the beach and made the above approach to the airdrome. In view of this, there might be certain advantages in landing further to the West between the Comoro River and Tibar. The approach from here by A.F.V.'s must be made along the coast road until the Comoro River is reached or tropical undergrowth and cactus make the area most difficult for A.F.Vs. This area is enclosed by the mountains to the South and spurs running to the coast at Tibar and to the west of the Comoro River.

The Dilli coastal area from Hera to the west of the Comoro River is also enclosed by a ridge of mountains running parallel to the coast south of Dilli, with spurs running to the coast at Cape Fatu Cama and to the west of Comoro River. A good foot and pony track runs along the top of the range from Remexio to Lau-Lora and overlooks the whole of the Dilli area. Spurs of the range run as close as 1,000 yards to the airdrome. O.P.'s were established by Australian troops in these spurs. Lau-Lora is reached by a good track leading up the mountain from the Comoro Valley just south of Comoro village.

b. *Fuilor* (8° 26' S., 127° 2' E.)—See Photo No. 3:

Construction of this airdrome which runs across the main road from Lautem about 1 mile (1½ km.) west of Fuilor (Vila de Avis) was commenced by the Japanese in November, 1942, and is continuing. It lies on the extreme northwest portion of Lautem Plateau and consists of two runways, one ENE/WSW, 1,300 x 100 yards (1,190 x 90 m.), and the other approximately N/S, 1,400 yards (1,280 m.) long. Both runways are capable of further extension.

The airdrome lies in open country 1,300 feet (400 m.) above sea level and is free from obstructions on all sides. Ten or 12 miles (16 or 19 km.) to the South the mountain range rises to 2,000 feet (600 m.) and 15 miles (24 km.) to the southeast it rises to 3,000 feet (900 m.).



There are good M.T. roads running from the site northwest to Lautem on the north coast, south to Loré near the south coast, and to the eastern extremity of the island at Tutuala. The surrounding country is suitable for A.F.V.'s and the airdrome could be approached by them from any direction.

4. Potential Airdrome Sites:

There are a number of areas in Portuguese Timor on which it is thought landing grounds could be constructed. Particulars of these are as follows:—

a. *Maliana*:

Located on the Nunura Plains.

The plains themselves are flat and smooth, covered with very high grass interspersed with thick clumps of palm trees and, on the eastern side, eucalyptus trees.

The 2/2 Australian Independent Company inspected a site about 1½ to 2 miles (2 to 3 km.) north of Maliana on the western bank of the Bulobo River, which appears suitable. The site is level and is covered with short grass and a few tree stumps. Some filling would be necessary. This can be obtained from the Bulobo River. Native labor was readily available at the time of inspection (July, 1942). It was estimated that 200 laborers could complete the work in 14 days. Labor should still be obtainable although not so readily.

Excellent dispersal in gum trees and palms is available close to the site.

b. *Manatuto*:

To the southeast of the town, and south of the main road, there are a number of paddy fields which, when dry, appear suitable. At present they are under wet rice cultivation, but would dry very quickly if irrigation were discontinued. (See Photo No. 54 and Map No. 20).

c. *Salazar Plateau*:

This plateau is located in limestone country with many limestone outcrops. There is some light scrub and no grass. Sites can be obtained here, but a considerable amount of work would be involved in removing the limestone outcrops.

A site which it is considered can be easily and quickly established exists 4½ miles (7 km.) off the main road between Vemasse and Baucau and 10½ miles (17 km.) from Baucau. Some outcrops of limestone would have to be removed.

Dispersal can be found in adjacent jungle patches.

d. *Between Baucau and Lautem*:

Following sites appear suitable:—

- i. At the mouth of the Seical River, located south of the road and west of the river. Here terrain appears suitable.
- ii. Sarau: Along the coast near Sarau, and between the coast and the road, there is extensive grass country with some lonthar palms.
- iii. Pt. Curo: Along the coast just east of the point, and between the coast and the road, the Portuguese cleared a site for an airdrome with a runway of approximately 600 yards (550 m.). This site appears to be capable of development.

e. *Lautem Plateau*:

Terrain between Fuiloro and Los Pala along the western boundary of the Lautem Plateau is suitable for airdrome construction. The Fuiloro airdrome is located in an area 3 miles (5 km.) by 1½ miles (3 km.), which was surveyed by Dutch Shell Co. and considered by it suitable for airdrome construction. The terrain south of this area is less level, there being a considerable number of grass hummocks which would increase the work necessary for clearing. The best labor in Portuguese Timor is available in the Lautem area.

f. *South Coast Area*:

There are numerous coastal plains along the south coast between the Dutch border and Loré. They are largely covered with high buffalo grass, coconut plantations and tropical undergrowth. It appears probable that a number of sites could be found on these, but it should be noted that these plains would almost certainly be very wet and probably boggy in the wet season. In addition communications proved a real difficulty in the western areas of the south coast.

A number of sites have been located either on the ground or from the air. Again most of these are likely to be wet and boggy in the wet season. Particulars are as follows:—

- i. and ii. sites, at Beco and Cumnassa. Selected by Australian ground forces. (The following report and recommendations were made on 24th June, 1942):—

i. *BECO*:

Situated at 9° 15' S., 125° 25' E. Is on Government land adjacent to posto, approximately 5 to 6 miles (8 to 10 km.) from Rai-Mean anchorage by horse track only and with several river crossings.

The area is mainly an old coconut plantation and, upon detailed inspection, after a large area had been cleared of the tall tropical grass with which it was

covered, it is apparent that much labor and time would be necessary to make a satisfactory runway. It is, however, definitely possible.

Although the area is generally level and flat, there are now visible many places where palms and trees have been removed in the past, and the surface in the vicinity is soft. Further, it would be necessary for many more to be removed.

Suggested runway comprises 1,200 yards by 100 yards (1,100 m. by 90 m.) at 225° running past and parallel with the posto hill for the first 200 yards (175 m.) from the northeast end.

The surface for the first 200 yards (175 m.) from the northeast end is good, but from here to the southwest end at 1,200 yards (1,100 m.), clearing is necessary, particularly over the last 400 yards (360 m.). From this point it could be extended indefinitely, but would require much more time and labor in proportion.

The lack of suitable adjacent hard binding material for filling—for places where trees and palms are or have been removed—is the greatest difficulty. It would need to be carried by natives from the river, a distance of $1\frac{1}{4}$ to $1\frac{1}{2}$ miles (2 to $2\frac{1}{2}$ km.).

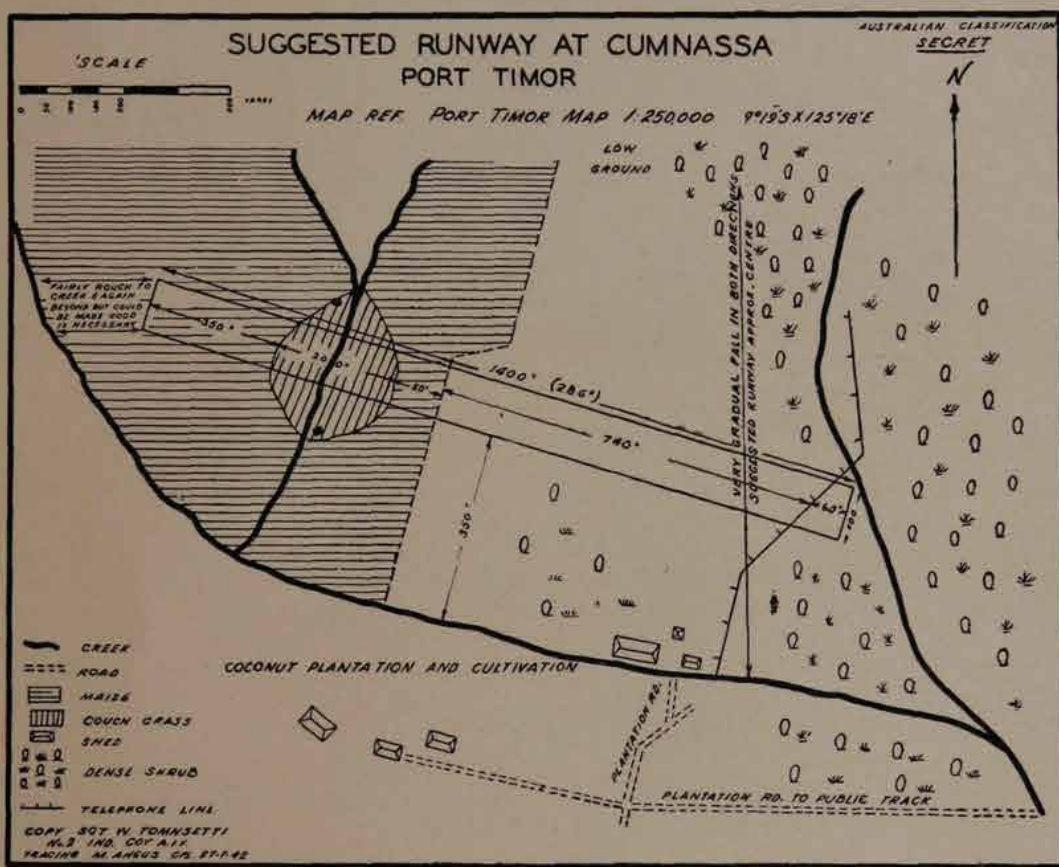
Apart from the trees and palms and soft patches caused by their removal there are no other obstacles.

The only natural cover is among the coconut palms of the adjoining plantation at the northeast end.

With the labor and tools available the area could be cleared in approximately two weeks, but it is not possible to estimate the length of time necessary to carry filling nor for it properly to settle. Turf sods are not available.

ii. CUMNASSA:

Situated at 9° 19' S., 125° 18' E. Is on the private property of Senhor Tenente Lopes, approximately $1\frac{1}{4}$ to 2 miles (2 to 3 km.) from Suai Bay anchorage by good cart track. Surrounding hills nil.



Eastern end is permanent grassed grazing land; western end is cultivated except for a small area which is also grassed grazing land. Extreme eastern end is tropical shrub and trees. Whole area generally flat.

Suggested runway is 1,400 yards by 100 yards (1,280 m. by 90 m.) at 286° along the highest portion and where least preparation is necessary.

At present the grazing land of the runway area is partly thinly covered with low shrub, easily removable with no disturbance of the surface, and approximately 4 or 5 large trees.

This cultivated area is planted with maize about 5 feet ($1\frac{1}{2}$ m.) high. It is considered that the whole runway surface, upon completion, would take, without risk, any aircraft up to the weight of a "Hudson Lockheed" under normal weather conditions.

The creek, telephone line, cultivation, trees and low shrub on the grazing area present some difficulty as obstacles. The creek is the biggest obstacle; it

crosses at approximately 1,000 yards (900 m.) from the east end, and is about 10 yards (9 m.) wide and 3 feet (1 m.) deep. It would be overcome by large box drain filling surfaced with turf sods; ample filling is available along the creek beds. The telephone line crosses the suggested runway as shown in the sketch, but it is understood there would be no difficulty or delay in taking this clear of the area generally. After clearing the crop on the cultivated area, the ground would require binding with sand and gravel which is available in the adjacent creeks, and—after rolling—should bind and set well. A 10 to 12 cwt. roller is available locally. The trees and low shrub on the grazing area are removable with little difficulty or damage to the surface.

Excellent natural cover for concealment of up to 10 to 15 aircraft is available adjacent to the boundary at the east end of the runway. This could be increased in that area indefinitely.

Ample native labor is available, but tools are few; thus full use of labor cannot be made. Based on tools available, it is estimated that the 1,000 yards (900 m.) from the east end to the creek could be made ready within 10 to 12 days (Senhor Lopes says 5 days) from time instructions are received at Cumnassa.

From and including the creek to the west end at 1,400 yards (1,280 m.), approximately another two months.

Recommendation: Taking all points into consideration, Cumnassa is regarded as the more favorable of the two sites.

iii. THREE MILES NORTHWEST OF BETANO:

There is a large open patch of ground 3 miles (5 km.) northwest of the creek mouth at Betano. The area is elongated northeast/southwest and is over 1,200 yards (1,100 m.) long and averages 300 yards (275 m.) wide. A track passes along its northwest side running northeast/southwest. There is a village of 20 huts at the northeast end. It is suggested that this might furnish a useful emergency landing ground. It is well away from any mangrove swamps or large rivers. The Betano Creek, which passes between it and the small village, has dwindled to insignificant size in the three miles between here and the sea. At the south end of the field there are a number of animal tracks converging on a spot, which may be a small waterhole, but this is uncertain.

The trees around the field are open and of medium size, probably small eucalypts and a few casuarinas ("She-oaks"). One or two scattered trees and patches of grass occur on the open patch, but a landing could probably be made without any preliminary clearing. The patch is certain to be soft and sticky at times, especially during the wet season (November-July).

iv. SOUTH OF BETANO VILLAGE:

There is another open patch of ground south of Betano village, between the latter and the creek. This is 1,500 yards (1,380 m.) long, but is partially cultivated, and does not appear to have the potentialities of the area three miles (5 km.) to the northwest.

v. FIVE MILES EAST OF THE SOUTH LACLO RIVER:

For about 6 miles (10 km.) east of the South Laclo River there are extensive alluvial flats (presumably of the Clerec River) with scattered areas of cultivation. Five miles (8 km.) east of the Laclo there appears to be an uncultivated patch large enough for an emergency landing ground. It is 800 yards (730 m.) north/south and probably more. Its average width is 350 yards (320 m.). It must be stressed, however, that the ground is in the vicinity of a swamp on a big river delta. It will, therefore, be flooded during the wet season.

vi. DOTEK PLAINS:

These have been suggested as suitable for emergency landing grounds.

vii. BEASSO AREA:

In this area there are several flat grass-covered areas which, upon inspection, may be found suitable.

viii. FOUR MILES SOUTHWEST OF ALIAMBATA:

Some 4 miles (6 km.) southwest of Aliambata, between two small streams called the Laguasa and the Saguito, there is a large area of open grassland about one to three miles (2 to 5 km.) inland from the sea. The "Exploration of Timor" describes it as very fertile, with a deep black loam very rich in humus. This suggests that the area is not swampy, though naturally it will be sticky during the wet season. In an area at least 2 miles (3 km.) long (east/west) and half a mile (1 km.) across (north/south), located halfway between the Laguasa and the Saguito Rivers, just south of the road, the ground appears suitable for emergency landing. The Saguito is reported to give a steady supply of water at all seasons.

ix. TWO MILES WEST OF ELOMAR:

About threequarters of a mile (1 km.) to the east of the Irabere River and 2 miles (3 km.) west of Elomar there is a large clear area bounded on the North by the road leading east from Beaso and Aliambata to Elomar and Saenamo. The southern boundary is about 500 yards (450 m.) from the coast, where there is a small creek and swamp. Its dimensions are about 1,400 yards (1,280 m.) east/west by at least 500 yards (450 m.) north/south, and it appears to be quite devoid of trees or bushes.

PART II: GEOGRAPHICAL INFORMATION

SECTION I

INTRODUCTION AND GENERAL DESCRIPTION OF AREA

1. General Description:

The Island of Timor is the largest of the Lesser Sunda Islands, which form the southernmost part of the East Indian Archipelago. It is bounded from the southwest to the northwest by the Sawoe Sea, Ombai Strait, and Wetar Strait, which divide it from the arc of islands stretching eastwards from Java towards New Guinea. On the southern side it is separated from the Australian continent by the Timor Sea. The island is about 290 miles (460 km.) long and its greatest width is 62 miles (99 km.). It extends from latitude $8^{\circ} 19'$ to $10^{\circ} 27'$ S., and from longitude $123^{\circ} 27'$ to $127^{\circ} 18'$ E. of Greenwich, the general trend being SW/NE.

Timor is divided politically between N.E.I. and Portugal. The Portuguese section includes the Enclave of Ocussi, approximately 328 sq. miles, and the small island of Atauro, 65 sq. miles (on Dutch maps Atauro is marked Poeloe Kambing). The total area of Portuguese territory is in the vicinity of 7,700 sq. miles.

The border line between the Dutch and Portuguese territories in Timor is shown on Map No. 1.

Dilli, on the northern coast, is the capital of Portuguese Timor and the residence of the Governor. The colony is divided into one *concelho* (Dilli) and five civil circumscripcoes which are, from West to East: Fronteira, Suro, Manatuto, Sao Domingos and Lautem.

For the purposes of convenience, all six divisions will be referred to as *provinces*. Each province is subdivided into numerous *districts*, each of which is governed by a Portuguese official from a "*Posto Civil*," or Administrative *Posto*.

The native population of Portuguese Timor numbers between 500,000 and 600,000. Its racial origins are not well understood, but appear to be intermediate between Malaysian and Melanesian.

2. General Topography:

Topographically the Portuguese part of Timor consists fundamentally of a 9,000 ft. (2,700 m.) mountain range running ENE/WSW down the center of the island. It is highly dissected and extremely rugged. Most of the rivers run north or south into the sea, after quite short courses. A secondary parallel range follows the north half of the north coast, thus deflecting the streams to East and West.

The coastal strip on the north coast is either very narrow or non-existent, the mountains coming right down to the sea in steep cliffs. On the south coast, especially the central and western parts, there are rolling plains up to 5 and 10 miles (8 and 16 km.) wide. Finally, there are three large plateaux all on the north coast, west, center and east—Balibo, Baucau (Salazar) and Lautem Plateaux, respectively.

The northern coast possesses one good harbor (Dilli), and several anchorages (only suitable during the dry season, May-November). The southern coast has no harbor, but several anchorages and landing beaches (only favorable during the wet season, December-April, unless very calm weather prevails). Coral reefs bound the headlands along both north and south coasts, but silt-laden rivers prevent the growth of corals along most of the coastline.

The largest towns are situated along the north coast or in the hills. There is a good road all along the north coast, with connecting links into the hills. Along the south coast, however, there are only poor tracks. Only two roads cross the island from North to South (Baucau-Beasso and Lautem-Loré), and these at the eastern end of the island. There are no roads passable by M.T. from North to South in the western part of the colony.

Movement is possible throughout the whole of Portuguese Timor on foot, or with pack horses. Movement on foot, off native tracks and made tracks, would be possible for small parties of infantry, because the main feature of the island is the open character of its vegetation, which consists largely of grass-land and scrubby eucalypts. Apart from a few limited areas, tanks and A.F.V.'s could not operate except with great difficulty.

3. Historical:

The first Europeans to settle in Timor were Portuguese Catholic missionaries, Dominican Fathers, at the beginning of the sixteenth century. Later, at the beginning of the seventeenth century, the Viceroy of Portuguese India, at last realising the growing importance of the new colony, appointed a Governor, who took charge of the temporal affairs.

At the end of the sixteenth century started what may be called a "colonial war" between Portugal and the Netherlands which, in spite of the re-establishment of peaceful relations between the two Powers in Europe, went on in the Malay Archipelago; a treaty was signed in 1661, but it did not settle the matter definitely. Finally, the two Powers realised the necessity of fixing definitely the boundaries of their respective possessions in the Archipelago, and a final treaty was signed in 1859 at Lisbon. As far as Timor was concerned, this set out the boundaries as now constituted.

The economical development of the island has been slow, as there has been no concerted effort to develop export trade and, except in the case of coffee, production is regulated to local requirements. The Portuguese authorities have contented themselves with building castle-like "postos" in many parts of the country, and connecting these with the capital with roads and telephone. No subsidies were received from the homeland, and the administration had to be self-supporting. In many cases the natives worked off their taxes by doing constructional work for the Administrators. Thus the postos are generally well-built with well-tended gardens. The rest of the country is entirely simple.

Commercial life on the island is in the hands of Chinese shopkeepers, and foreign capital has not been encouraged. The exploration for oil led to boring as early as 1914, but development has been held up owing to political jockeying.

In recent years the Asia Investment Company obtained extensive agricultural and mineral rights, and started surveying the country in April, 1936. The preliminary work was completed in June, 1937.

4. Maps:

The first map of any consequence was compiled by the Asia Investment Company. Using Dutch Marine Charts as a nucleus, it was compiled with the aid of Brunton compasses and aneroid barometers, showing the details of topography, location of trails, postos, and other features, both natural and cultural. In areas of special economic interest surveys were made with either transit, or plane-table and stadia.

The present standard reference map (1/250,000) was compiled by the Topografische Dienst, Batavia (1941), (a) partly from the map issued by the Asia Investment Company (1937), and (b) partly from nautical charts of the Royal Netherlands Navy. It is consequently a somewhat hybrid production and, in view of its history, it is surprising that it is as accurate as it is.

At the same time as the topographical map was made, an approximate geological map was also constructed by the Asia Investment Company. A full report of the exploration work of the Company, with detailed maps and photographic documents, has been published under the title of "The Exploration of Portuguese Timor."

On the Standard Map the coastline is moderately accurate, being based roughly on the Dutch Nautical Charts which are the result of reasonably accurate survey. The physical features are accurately represented in places and in other areas are broadly generalised. The position of river-mouths is not always correct, as has recently been shown by a photographic reconnaissance of the whole length of the south coast. (See Map No. 2).

Sometimes the Portuguese name is used, sometimes the native name, and sometimes both. In the case of Venilale (Vila Vicosa), the two names on the Standard Map appear against separate localities, while in point of fact they are one and the same place. Many similar errors occur. The capes are marked partly in Portuguese (from the Asia Investment Map) and partly in Malay (Dutch phonetics). Thus Pta. (Punta) in Portuguese means Tg. (Tandjoeng) in Malay, and both simply mean "Cape."

This Standard Map has been reproduced by the Office of the Chief Engineer, USAFIA (May, 1942). The original Asia Investment Company Map has also been reproduced (without Dutch additions) by the U.S. Army (G.S.G.S., Washington, 1942). A revision has been carried out for this study. (See Map No. 1). The revision includes redrawing of the south coastline from recent Netherlands Charts and from Coastal Strip Maps (Map No. 2), and realignment and classification of the road and track system. Many Sparrow Force field sketches have been made. There is also a reannotation which should eliminate the anomalies in place names. It shows always the native name first (followed by the Portuguese name in brackets). This has been done because the latter names are very little used on the island, even by Portuguese officials themselves, or by our forces, and simply appear on certain Portuguese official papers.

It is understood that a revised map for general distribution is now being prepared by the Chief Engineer, USASOS, from the new information which is now available.

5. Areas of Military Importance:

The area of greatest military importance in Portuguese Timor is the capital, Dilli, because Dilli has quite a good harbor, which is also a very good seaplane

base, and because of the strategical situation of Dilli in relation to the important western section, which includes the Bay of Koepang (Dutch Timor).

The extreme eastern end of the island, in which is the Lautem Plateau or Fuiloro Plain, and the straits between Timor proper and the small island of Jaco, are also of military importance. The Lautem Plateau, according to many reports, offers the best site in the eastern part of Portuguese Timor for an extensive operational airdrome which has now been developed by the Japanese. It is not more than 5 miles (8 km.) from a small but good harbor called Com. The straits of Jaco provide shelter in all weather for vessels of 5,000 tons, or possibly larger.

Another area of military significance is the southwestern end of Portuguese Timor. There are several anchorages and landing places here, and foot and pack-horse movement is possible in the dry weather across the island. There are areas in the south coast which would also be suitable for operational airdromes.

SECTION II—ISLANDS AND SUB-DIVISIONS

1. Kambing or Atauro Island (8° 15' S., 125° 35' E.):

Because of its small size, lack of harbors or good anchorages and negligible resources, it is of no military value. There are no areas reported as being suitable for airdromes or seaplane bases.

The island lies approximately 17 miles (27 km.) north from Dilli, the capital of Portuguese Timor. It was used as a penal settlement for the colony. Its area is approximately 140 sq. miles. It is mountainous, and water is very scarce because the monsoonal season with attendant rains misses this area. A small group of mountains, the highest elevation being Manokoko Peak (3,400 feet; 1,030 m.), is located in the southern part of the island, but this mountain range extends northwards with lower elevations. Drainage is through a few short streams which head in these mountains, cutting steep ravines and gorges. Except on the south coast, where coral limestones appear, the rest of the island is basically igneous.

2. Jaco (8° 25' S., 127° 14' E.):

This is a small island of about 6 sq. miles in area lying off the easternmost point of Portuguese Timor. It is rocky, lightly wooded, and has only a transitory native population. There is no development whatsoever on the island, and its only military value is its effect strategically upon the straits between it and the mainland. These straits offer good harborage for shipping.

3. Province of Ocussi (9° 20' S., 124° 20' E.):

This area is separated from the main portion of Portuguese Timor, being an enclave. For military purposes, there is no direct bearing on Portuguese Timor, and it will therefore be dealt with in the study of Dutch Timor.

SECTION III—OFFSHORE CONDITIONS

A—THE NORTH COAST

From the Border of Dutch and Portuguese Timor to Cape Sevivara:

1. Reefs and Depths:

The sea bottom is steep except for a section of the coast in the vicinity of Dilli and opposite Hera, where there are some known shoals with a depth of 6 fathoms (10 m.). The 100 fathom (200 m.) curve lies close to the coast nearly everywhere.

The Ombai passage (Malua Strait), the passage between Alor and the northwest coast of Timor, is 16 miles (26 km.) wide in the narrowest part and is apparently free of dangers. It is wide, deep and clear.

So is the passage between Alor Island and Kambing Island, and between Kambing Island and Liran Island. The last passage is about 6½ miles (10½ km.) wide.

Wetar passage, between Wetar and Timor, is wide and clear. It was used much by the international traffic of the routes Java-Australia. Outside the 100 fathom (200 m.) curve there is no record of dangers. Sumatra Reef, with a least depth of 14 fathoms (28 m.), should be noted; discovered in 1853, it is charted 20 miles (32 km.), 100° from the north point of Kambing.

2. Prevailing Winds:

The southeast monsoon blows steadily between the middle of April and the end of September from ESE to SE, the land breezes from Timor increasing the force of the wind at night and the sea breeze diminishing it by day. Similarly, in the other season, the wind will be most steady by day and unreliable at night.

In October and November the winds are from SSE to SSW, and in December from the southwest quarter accompanied by thunderstorms, but the westerly monsoon does not reach its full development from west to WNW until January and begins to abate in February. Circulating and variable winds will then blow until April.

Cyclonic storms are occasionally experienced; they appear to be confined to the transition period between the northwest and the southeast monsoon, more particularly from the end of March to the beginning of May.

3. Tides (at Dilli):

The tide is predominant diurnal. The range at neap is not known, the range at spring is 6 ft. Spring occurs two days after full moon and new moon with high water at 1 h. 30 and 13 h. 30. (Timor time is G.M.T. + 8 hours).

4. Currents:

Ombai Passage:

During the southeast monsoon the general set of the ebb current is from southwest to west, and in the west monsoon from northeast to east; the average rate is from 18 to 10 miles (29 to 16 km.) in 24 hours, but in June, when the current to the southwest attains its greatest speed, a ship has been set at a rate of 3 knots in that direction. Off Alor and Pantar Islands the current during the southeast monsoon runs more to the northward and in the west monsoon strongly to the SSW from those straits.

Under the Alor shore the current appears to be weaker than in the middle of the passage or under Timor.

Channel Between Kambing Island and Liran:

The tide runs through this channel with considerable velocity and frequently causes a turbulent sea with heavy tide rips off the north point of Kambing and the south point of Liran.

Very heavy tide rips are met 4 miles (6½ km.) southward off Kambing Island, also at 7 miles (11 km.) westward of the southwest extremity, and at 14 miles (22½ km.) eastward off the center of the island.

Wetar Passage:

The current effect is little in the open sea. There is, however, a constant current from the West, which is either augmented or diminished by the monsoon drift.

Passage Between Kambing and Timor:

The tidal currents between Kambing and Timor are weak.

B—THE SOUTH COAST

From West to East:

1. Reefs and Depths:

There are no bays or harbors which offer shelter in the easterly monsoon, and it is seldom visited. General depths of 200 to 400 fathoms (400 to 800 m.) are found 3 to 5 miles (5 to 8 km.) off, gradually decreasing toward the shore, and only in a few places are there any sudden transitions from deep to shallow water. In the western monsoon considerable discoloration of the sea is seen, caused by the discharge from numerous rivers and streams.

The coast sea is deep and clear without off-lying dangers. Ships can navigate safely close to the shore.

The channel between Jaco (Jako) Island and Timor (east point) is 800 yards wide and clear, with 13 to 15 fathoms (26 to 30 m.) in the narrow part.

2. Prevailing Winds:

See A, above.

3. Tides:

Are predicted for harbor Saenamo (Dai-Name) (127° E.). (See Section IV, B, 8). Range at spring approximately 10 feet (3 m.).

4. Currents:

In open sea, currents are weak; in both monsoons the currents run to the southwest outside the 100 fathom curve (200 meter curve) and close to the Timor shore currents are not due to tides.

The currents close to the shore are weak.

The Channel Between Jaco (Jako on Chart) Island and Timor:

Tidal currents run directly through the passage at a maximum rate of 3 to 4 knots and appear to continue longer north than south; strong ripples are then formed with a heavy sea for boats.

C— LIST OF CHARTS

	Neth. Charts	Eng. Charts	American Charts
Timor	117		3002
Southeast Coast	328, 329, 375		
North Coast	375, 378, 376		
Dilli Harbor	378	1460	H.O. Chart 3022

SECTION IV—ANCHORAGES

A—THE NORTH COAST

From West to East:

Anchorage possible nearly everywhere. The K.P.M. vessels usually visiting this coast were of about 1,500 tons.

1. Batugade (8° 57' S., 124° 58' E.):

Seven miles (11 km.) northeast of Atapoepoe, is a Portuguese settlement lying in a valley surrounded by picturesque mountains.

The anchorage is in 11 fathoms (22 m.), sand and mud, 300 yards (275 m.) offshore abreast of the fort. The water deepens rapidly to seaward. Usable for every size of ship.

Sheltered in east monsoon, but the sea is generally very calm on the north coast. There is a very light surf from May to November.

Easy to approach. Northeastward of the anchorage is a black rock, Pedra de S. Antonio (Fatoe Santoe Antonio on chart), about 120 feet (37 m.) long and 30 to 40 feet (9 to 12 m.) high, connected to the shore by a drying ledge; from seaward the rock shows as a black square against the green background. The anchorage is with the flagstaff bearing 142° and the rock Pedra de S. Antonio (Fatoe Santoe Antonio on chart) 33°.

The best landing is near the fort, where boats are moored. A rivulet flows out on the east of the village, but it is often difficult to obtain water from it on account of the surf.

2. Lois River:

The Lois River (Meta Loes on chart) runs out through a large plain 14 miles (22 km.) NNE of Batugade.

There is good anchorage southward of the mouth in 22 fathoms (44 m.); sand about 300 yards (275 m.) from the shore.

Shelter similar to above.

Easy to approach, the mouth of the Lois River is rendered very conspicuous by some casuarina trees.

Anchorage is with the house there bearing 116° and Cape Fatu Beru in range with the point of land by Lois River.

The River Lois is the only river in Timor which never dries in the south-east monsoon.

3. Maubara Road:

Five miles (8 km.) east, northward of Cape Parimbala. The residence of the military commandant; used as a native fishing port.

There is temporary anchorage in about 28 fathoms (50 m.).

Strong tide eddies cause a ship to swing and foul the anchor.

Can be readily distinguished from seaward by the church and the house surrounded by a high stone wall right on the beach. The residence of the military commandant, situated on the summit of the hill, is also conspicuous.

There is a beach strip suitable for landings where boats can be brought close inshore.

4. Liquissa—Vila de Liquiça (Likisa on chart)—See Photo No. 14 and Map No. 13:

Seven and a half miles (12 km.) eastward of Maubara. One of the principal places on the north coast of Timor, being the residence of a Government official.

There is good anchorage in about 28 fathoms (50 m.) sand.

Shelter, see 1 above.

Easy to approach. The large assembly building can be seen from seaward. The anchorage is with the building in line with the customs house on the beach. There are no reefs reported.

5. Aipelo (125° 23' E.)—See Map No. 12:

Three and a half miles (5½ km.) east of Liquissa (Likisa on chart).

There is good anchorage offshore, as along the whole of the north coast.

The anchorage is exposed to northerly winds.

The beach is of white sand about 60 feet (20 m.) wide and 500 yards (450 m.) long.

6. Pt. Motael (125° 32' E.):

Near Cape Mau-duqui (Mau Doeki on chart).

There is a good anchorage here offshore in an area which is free from reefs and has good water.

It is exposed in the northwest monsoon.

The Japanese used this area for one of their landing places.

There is a good landing place between Pt. Motael and the airdrome of Dilli. The beach is about 450 yards (410 m.) long with no reefs offshore.

7. Dilli (125° 35' E.):

(See Ports and Harbors, Section V).

8. Hera (125° 41' E.):

There is good anchorage available.

There is a shoal, $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) offshore with a depth of 6 fathoms (12 m.).

There is a beach of 160 yards (150 m.) without reefs offshore. The motor road to Dilli is not far away from this beach.

9. Laclo River (126° E.):

Offshore off the river mouth the water is very shallow and free from reefs, but drops suddenly into deep water.

Anchorage is available.

The Japanese used it as a landing base for Japanese forces.

The North Laclo River itself is shallow and provides no anchorage, either at its mouth or through its length.

10. Manatuto—Manatoetoe on chart (126° 01' E.)—See Photo No. 54:

About 3 miles (5 km.) ESE of Cape Subao (Soebang on chart), is a fairly important place and the residence of a Government official.

There is anchorage in about 30 fathoms (60 m.). The bottom in the anchorage is soft mud and not good holding ground.

There is no landing place except on the beach, which is steep-to, and there is a heavy swell at times.

Easy to approach. It can be easily distinguished by a white church with two towers and some houses built on a hill.

Anchorage is with the light structure, a white conical masonry beacon, bearing about 210°. There are many reefs eastward from this anchorage. One Portuguese ship recently lost two anchors in the coral.

Manatuto was the exporting place for the surrounding district, and a coastal steamer called monthly to collect cargo. Sheep and fowls were obtainable.

It was used as an anchorage by the Japanese forces and they landed troops from here in shallow draught barges in which they also conveyed M.T.

11. Salgueiros (126° 03' E.):

There is a good open anchorage here. K.P.M. boats used to lie about 400 yards (350 m.) offshore.

The anchorage is exposed during the northwest monsoon.

There are practically no coral reefs inshore and none reported offshore.

The beach lies between two sections of coral reefs about 800 yards (730 m.) apart.

12. Lamsana Bay (126° 04' E.)—See Photo No. 39:

Situated on the south side of a bay.

Large ships have to anchor outside the bay. Depth of water inside the bay is from $2\frac{1}{2}$ to 3 fathoms ($4\frac{1}{2}$ to $5\frac{1}{2}$ m.), and therefore only suitable as an anchorage for small vessels.

Well protected anchorage inside the bay in all weathers.

The entrance is free from coral reef, but there are rocks at the head of the bay.

There is protection from observation by air all round Lamsana.

13. Vemassee (126° 13' E.):

This is an unprotected anchorage, and boats have to lie more than 500 yards (450 m.) offshore to get sufficient water.

There are many coral reefs inshore.

14. Baucau—Vila Salazar (8° 28' S., 126° 28' E.)—See Map No. 23:

A place of some importance carrying on a brisk trade with the adjacent islands, is situated a short distance from the coast at a height of about 1,047 feet (320 m.). It is the residence of a Government official.

The anchorage is in 22 fathoms (40 m.), coral. K.P.M. ships lie off about 500 yards (450 m.). Anchorage for boats of approximately 600 tons, about 200 yards (175 m.) offshore.

Vessels lie well here in the west monsoon. In the east monsoon, with rough weather in the months of May and June, landings should be done in the morning.

Anchorage is with the light structure on the coast bearing 212°. Easy to approach.

Exports were principally rice, maize, horns and sandalwood. The shore, very steep, has no beach and a small coast reef; is suitable for landings.

15. Laga (126° 36' E.):

Built on a hill 8½ miles (13½ km.) eastward of Baucau.

There is anchorage in 17 fathoms (30 m.), mud, close to the shore, with the fort bearing 158°.

Easy to approach, rendered conspicuous by a white fort.

16. Laivai (126° 44' 5" E.)—See Map No. 30:

There is anchorage in 17 fathoms (30 m.), coral. K.P.M. ships anchor 400 to 500 yards (350 to 450 m.) offshore.

The anchorage is well protected during the west monsoon.

Easy to approach. The anchorage is with Cape Laivai bearing 297° and the flagpole of the fort bearing 227°.

17. Lautem (Vila Nova Malaca)—Lautaim on chart (126° 54' E.):

Is the headquarters of a military officer, and is a place of some importance. Exports were hides, copra and timber.

There is good anchorage in 11 fathoms (20 m.). The water shoals rapidly further inshore because the little bight is shallow but free of coral rocks. There are coral rocks at both corners of the bight. K.P.M. vessels used to anchor here. For small ships anchorage 200 to 300 yards (175 to 275 m.) offshore.

Only good anchorage in the east monsoon.

Easy to approach. A white fort built on a rocky point is very conspicuous. Just eastward of the rocky point the coast bends in a little, and there are four stone pillars (probably intended as a foundation of a light structure) on the beach. With these bearing 150°, there is good anchorage in about 11 fathoms (20 m.). Inshore and along the beach are coral reefs.

18. Com—Koën on chart (127° 04' E.)—See Photo No. 89:

A village about 4 miles (6 km.) eastward of Cape Chater (Chatoe on chart).

There is fairly good anchorage in 25 fathoms (45 m.), stony bottom. There is a natural harbor for small vessels up to 2,000 tons. The harbor is protected on either side by coral reefs, but depth decreases rapidly towards the shore.

The harbor provides shelter at all seasons of the year. It was used as a refuge port in bad weather.

Easy to approach, anchorage is with the middle of the rocky point just eastward of the village bearing 230° and Cape Apilé bearing 310°. The bottom is very steep.

The entrance of the natural harbor, about 200 yards wide, is clear with a deep water passage and no reefs. Anchorage is here about 300 yards (275 m.) from the beach.

19. Loiquere (127° 10' E.):

There is, about 7 miles (11 km.) east of Com, a possible anchorage.

There is very deep water close to the shore.

20. Tutuala—Toetoeala on chart (127° 16' E.):

A possible anchorage on the easternmost end of Portuguese Timor.

No information as to reefs, or other conditions, but there is very deep water close to the shore.

Easy to approach.

Because of steep cliffs behind, it is unlikely to be of any military value.

21. Jaco—Jako on chart:

On the north side of the island.

Good anchorage in 13 fathoms (25 m.), sand and coral, 400 yards (350 m.) from the island. On the north side the depths gradually decrease.

Sheltered in west and east monsoon.

Easy to approach. Anchorage is with the north point of Jaco 96°, and the east point of Timor 189°. The island is a small flat island appearing as a tongue of land before it opens for Timor. The island is circular, 2½ miles (4 km.) in diameter, and wooded, the tops of the trees being 350 feet (105 m.) above the sea. A coral reef fringes the island, varying in width from a few yards on the western side to about 600 yards (550 m.) on the north and south sides.

Probably some current will be encountered at the anchorage, because of the occurring tidal currents in the passage between Timor and Jaco.

The island is uninhabited.

B—THE SOUTH COAST

From West to East:

1. Masin or Talas River—Mota Massin on chart (125° 5' E.):

There is an anchorage in about 6 fathoms (11 m.) at the mouth of the Mota Wedieken.

The Mota Wedieken flows out 2 miles (3 km.) south of the Masin River.

2. Cape Suai (125° 16' E.):

Five and a half miles (9 km.) northeast of Cape Tafara, is a low point fringed by a coastal reef nearly 3 cables wide.

There is an anchorage in 15 fathoms (27½ m.) suitable for big vessels with local knowledge off the southwestern side of this point. Small ships anchor 150 to 300 yards (150 to 275 m.) offshore, and unload into shallow barges or rafts.

With a southerly wind the water is rough and there is a heavy surf. It has been used all the year round for landing supplies, but with difficulties at times. This condition would apply from June to September, but stores for the 2/2 Australian Independent Company were landed from the *Kuru* about 12 times during April to August without trouble. The latter was possible because of slight shelter in landing provided by the spit on the west side of the river mouth.

No difficulties in approaching; the military post of Suai is conspicuous.

3. Rai-Mean (125° 31' E.):

Approximately 6 miles (9½ km.) east of the mouth of the Lono-Mea River (not as shown on map).

The anchorage is not very good.

The surf is sometimes very heavy and rough and there is no shelter in the southeast season. It was found necessary during April to desist from landing stores and return to Suai, which is more sheltered.

4. Betano—Nudur (125° 44' E.)—See Photos Nos. 18, 19, 20:

Two and a half miles (4 km.) northeast of Cape Lalete. Cape Lalete is low and marshy.

The bay is 2½ miles (4 km.) across the eastern half being full of reefs, some nearly exposed at high tide. The western half is clear but exposed to the southeast. As a result the anchorage was not often used in the southeast season.

The anchorage is in 11 fathoms (20 m.) about 300 yards (275 m.) southeast of the wreck, but in order to avoid the fate of the wreck, it is recommended to let go anchor when 16 fathoms (30 m.) is reached. This wreck is a good identification mark, but not a prominent landmark; 4 to 5 miles (6½ to 8 km.) is the limit for visibility from seaward. Other identification marks were the customs house and a post on a concrete stand. Approaching this post on a bearing of 315° would miss the end of the reefs.

5. Cape Beasso (126° 29' E.)—See Photos Nos. 66 and 67:

Cape Beasso is a low point about 10½ miles (17 km.) eastward of Cape Luca.

Anchorage is obtainable in any depth by closing into the shore in bearing white pillar 24°. In the southeast monsoon there is a high surf and heavy swell. The inner bay is about 250 yards (225 m.) wide across the entrance, and is well sheltered, facing slightly west of South. Small craft can anchor 150 yards (140 m.) from the beach at high tide.

Beasso landing place is situated about 1½ miles (2½ km.) westward of Cape Beasso and is rendered conspicuous by a custom-house, a white pillar and a small beacon with a ball topmark. The coast may be approached with the latter in range.

6. Aliambata (126° 35' 30" E.)—See Photo No. 68 and Map No. 21:

Lies in the neighborhood of Cape Roro-Ai (Roro Ai on chart).

The bay is 2½ miles (4 km.) wide, with the portion northeast of the beacon fringed with reef. This gives no shelter and the bay is exposed to the southeast. The beacon consists of a white beacon and post and may be approached on a bearing 45°. There are 20 fathoms (35 m.), 8 cables and 9 fathoms (16½ m.) 4½ cables from shore. Small craft could anchor 1½ cables from high water mark.

7. Elomar (8° 45' S., 126° 46' E.)—See Map No. 28:

On the shore of a small bay 3 miles (5 km.) west of Cape Oca Ona.

There is an anchorage in about 4-5 fathoms (8 to 10 m.).

A drying reef extends from the eastern shore of this bay, but off the village is a broad sandy beach affording good landing.

Two pillars in line bearing 026° lead to the anchorage.

8. Saenamo Road—Dai-Name (8° 41' S., 126° 59' E.):

Is situated 10 miles (16 km.) northeast of Cape Batu Puti (Batoe Poetih on chart) close westward of the low Cape Loré.

Anchorage can be obtained everywhere; see chart and plan on N.E.I. Chart No. 329.

Small craft can anchor inside the channel.

A channel about half a mile (1 km.) wide leads through the broad coastal reef to the landing place, which is sheltered in both monsoons.

Two pillars near the beach in line bearing 350° lead through the middle of this channel; the western edge of the channel is indicated by the alignment of two white posts standing westward of the pillars and the eastern edge by the alignment of two white posts eastward of the pillars.

The tide was predicted at Saenamo. Time is local time—G.M.T. + 8 hours.

Characteristics of tide: Mixed. Mean level 6 feet above datum of chart.

Semi-diurnal—

Spring tide $3\frac{1}{2}$ x 24 h. after	FM & NM:	average range	6.5 feet
Neap	Quarters		2 feet

HW Spring at	1 h. 30 & 12 h. 30	From 6 days before to six days after spring every day 45 mins. later. At neap 6 hours later than at spring.
LW	7 h. 30 & 19 h. 30	

Diurnal—

Spring tide 1 x 24 hrs. after moon's	greatest decl.:	average range	5 ft.
Neap	decl. = 0		2 ft.

HW 1 Jan. at	19 h. 30, 1 July at	7 h. 30; every week $\frac{1}{2}$ hr. earlier
LW	7 h. 30	19 h. 30

Neither the spring high waters, nor the spring low of the two tides can coincide. The highest that can be expected is about 5 feet above mean level during April/May at 13 h. 30 and October/November at 1 h. 30. (At semi-diurnal spring). The lowest tides that can be expected are 5 feet under mean level during June and December at 19.30 and 7.30, respectively (at semi-diurnal spring tide). For fuller information see explanations in Terrain Studies Nos. 44 and 45.

To the east of Cape Loré a possible suitable landing place is reported.

A ship of 3,000 tons anchored a few cables offshore, good anchor ground, but a strong current.

There is a coral reef, with a good beach behind.

SECTION V—PORTS AND HARBORS

1. Dilli Harbor (8° 34' S., 125° 35' E.)—See Photos Nos. 1 and 16:

a. Dilli is located on the north coast of Timor in the southern part of Dilli Bay about 28 miles (45 km.) east of Cape Parimbala. It is the principal Portuguese establishment in Timor, and was frequented by vessels passing through Ombai Passage when in want of provisions.

b. The bay between Cape Fatu Cama and the muddy Cape Mau duqui (Mau Doeki on chart) consists of an outer and inner roadstead. The outer roadstead may be used for large vessels. The inner roadstead is sheltered from the sea by reefs extending from the east and west points of the bay, and a large detached reef between them; these reefs are mostly dry and consist of sand and coral. There is only a narrow passage on either side of the detached reef, the western, about 200 yards (175 m.) broad, being generally used.

c. The outer roadstead is open and exposed to prevailing winds and storms in the northwest monsoon. The inner roadstead gives shelter in all weathers.

d. The outer roadstead has good anchorage in about 28 fathoms (50 m.), sand southeast from the little coral shoal, with a depth of 14 fathoms (25 m.). The inner roadstead is about $\frac{1}{2}$ mile (1 km.) in extent. The depths in the western entrance are 9 to 12 fathoms (16 to 22 m.), while the depths in the roadstead are 10 to 13 fathoms (18 to 24 m.).

There are two marked coral patches in the roadstead.

e. Owing to the low situation of the town behind high trees, it is picked up with difficulty when coming from the northward, but to the eastward is the bluff, projecting Cape Fatu Cama; vessels can run up to the roadstead by keeping the peak of Atauro (Kambing on chart) Island bearing 7° astern; the lighthouse will be sighted about 10 miles (16 km.) distant and the houses, also the spire of the cathedral over the tops of trees, will be visible at about

5 miles (8 km.) distant. Mount Curi (Kuri on chart) is a useful mark for a cross bearing.

To enter the inner roadstead by the western channel, pass between the red and black light buoys in a depth of 9 to 12 fathoms (16 to 22 m.), then steer for the flagstaff near the barracks on a bearing of 132°, passing eastward of the coral patch on the western side of the road, marked by a black and white horizontally striped buoy; when this is passed, steer for the customs house and anchor as desired.

In the eastern channel, which is not recommended and should not be used by a stranger without a pilot, there is only a passage 100 yards (90 m.) broad on either side of the 1½ fathom (3 m.) patch. To enter it, bring the barracks flagstaff to bear 183°, which will lead in depth of 10 to 14 fathoms (18 to 25 m.), then steer for the anchorage, passing northward of the black and white horizontally striped buoy on the detached reef southward of this entrance.

f. Large vessels should anchor outside the harbor on Brilliant Bank with the lighthouse 1¼ miles (2 km.) 162° and Cape Fatu Cama (8° 31' S., 125° 36' E.) 76°. The bank has a least depth of 13 fathoms (24 m.) for ¾ mile (1,200 m.) in an easterly and westerly direction.

Small vessels can anchor in the inner harbor in 13 to 10 fathoms (24 to 18 m.), mud, with the barracks flagstaff bearing 134° and the church bearing 266°. For loading or unloading and to procure good drinking water, it is more convenient to anchor close under the shore to the westward of the southern coral reef in 12 fathoms (22 m.), and with the ship's stern made fast to one of the large trees on the beach. In the vicinity is a water tap.

Pier: There is a 90 foot (27½ m.) pier off the customs house, suitable only for light craft.

There is good landing almost everywhere; the one recommended is to the west of the pier, where there is a sandy beach and deep water.

Supplies: Provisions such as beef, vegetables and fruit used to be excellent, and were obtainable in abundant quantities. There was a limited supply of bread. Good drinking water is obtainable from a water main which runs rather slowly.

Capacity: The harbor is almost entirely lacking in landing equipment or facilities. The depth of water off the 90 foot (27½ m.) pier—T shaped—is about 4 fathoms (7½ m.). There are no cranes or facilities for landing cargo or equipment. Approach to this pier is possible. A Japanese ship, the *Nanyo Maru*, is beached just east of the pier and does not prevent small ships from tying up at pier for unloading.

The capacity of the harbor is estimated at two 6,000 ton vessels and two of up to 3,500 tons, with careful berthing. There is ample open water for anchorage outside the reef.

g. There are no tugs, lighters or barges available at Dilli.

SECTION VI—DESCRIPTION OF COASTLINE

A—NORTH COAST

From West to East:

1. Batugade to Cape Morai:

There are good anchorages off Batugade and also off the mouth of the Lois River. The coast is sheltered during the southeast season and heavy surf occurs only occasionally during the northwest season.

The shore is partly sandy beach and partly reefs and there are many places where landings would be possible. Lack of road communication renders the section unimportant except near Batugade, where the Koepang-Dilli road approaches the shore.

At Batugade there is a white sandy beach, with the best landing place near the fort. The country behind is mainly flat. Vegetation is dense lonthar palm (2 feet diameter, 3 to 6 feet apart: ¾ m. in diameter, 1 to 2 m. apart) with elephant grass in between. Foot movement possible, but slow.

North to Cape Morai the coast is sandy with patches of coral, broken by the mouth of Lois River. There are many beaches where landings could be made. There is rough country behind the northern section.

2. Cape Morai to Liquissa:

There is good anchorage off Maubara. The shore consists of patches of beach interspersed with reef, and landings are possible on many of the beaches except during heavy northwest weather.

The road Maubara-Dilli lies close behind the beach. It is passable for M.T. during the dry season, but delays are likely during wet weather.

No information available on vegetation behind beach.

In general, there is rough country south of the motor road, but there is no information on width of coastal littoral.

3. Liquissa to Aipelo—See Photo No. 14, Map No. 13:

Between these two anchorages, which are both possible landing places, there is a stretch of white hard sandy beach about 3 miles (5 km.) in length, broken by patches of coral reefs and cut across by small creeks. Landings could be effected anywhere here by small boats in the southeast season. The motor road to Dilli passes close to the shore and about a mile ($1\frac{1}{2}$ km.) west of Aipelo. There is a cutting through rock for 600 to 700 yards (550 to 650 m.). The country inland from this road consists of low hills, timbered and grassed.

Aipelo is an unprotected landing place with patches of reefs inshore; it offers good anchorage in calm weather, but is very shallow. The main beach is of white sand, hard, about 30 yards ($27\frac{1}{2}$ m.) wide and 600 yards (550 m.) long. Inland from the beach there is good protection from air observation. Drinking water is scarce.

4. Aipelo to Tibar:

Eastward from Aipelo for about 1 to $1\frac{1}{2}$ miles ($1\frac{1}{2}$ to $2\frac{1}{2}$ km.) is a sandy beach broken by patches of reef which become increasingly frequent and extensive to the East. From Cape Caitehu east to Tibar there is a continuous fringe of reef up to $\frac{1}{2}$ mile (1 km.) wide and unsuitable for landing. The road to Dilli passes close inland. There is fair timber growth and air cover along this portion of the coast.

5. Tibar to Pt. Motael:

Tibar Bay could only be used for landing with great difficulty because its shore is flat and swampy with mangroves and, for the most part, is seriously coral bound. Immediately south of the mangroves the road from Maubara joins the inland road from Bobonaro and runs roughly parallel to, and in close proximity with, the coast into Dilli. There is a spring of fresh water near the shore, but this is often flooded by the sea during heavy tides.

East of Tibar Headland, a steep promontory projecting to a rock-bound shore, is a shelving sandy beach extending to the mouth of the Comoro River. At $125^{\circ} 30' E.$ a landing could be made opposite the cactus flats and three salt lakes.

From Tibar Headland to Cape Fatu Cama runs a coastal range with several spurs running towards the sea. The largest spur, immediately to the west of the Comoro River, runs practically to the sea. A cutting 80 yards (70 m.) long and 50 feet (15 m.) high has been made through this spur for the road. Control of this spur and points along the coastal range would be of considerable importance for any invading force attacking Dilli. A track runs along the coastal range from East to West with several feeder tracks to the coastline.

Cover in the cactus area is good, but there is only scattered cover along the road.

6. Pt. Motael to Hera—See Photo No. 15, Maps Nos. 3 and 4:

From the mouth of the Comoro River to a position approximately 800 yards (725 m.) west of the western side of the airdrome the sandy beach continues, uninterrupted by reefs. From this point to Dilli Harbor the beach is coral-bound.

The open beach is mainly gently shelving, of firm white sand, and always calm in the southeast season. Except during heavy northwest weather, landings from M.L.C. or ships' boats are always possible. This beach was used by the Allies and the Japanese when landing to occupy Dilli.

In Dilli Harbor there is always calm water, but approach at low water is limited to two channels on either side of the reef which fronts the inner harbor.

The beach is firm white sand, from 20-30 yards (20 to 30 m.) wide and overhung in places with trees. The best landing beach is immediately west of the pier, which is 90 feet (27 m.) long with 4 fathoms (8 m.) of water, but suitable only for small vessels.

Reefs extend seawards on both sides of Dilli Harbor. On the East there is also a rocky headland with a rock strewn beach not so suitable for landings. This rocky beach, with stretches of fringing reefs, continues to Hera.

The Dilli airdrome (see Photos Nos. 1 and 2) is close behind the beach immediately west of the lighthouse, and from here to Dilli the main road is also adjacent to the coast. From Dilli east the Baucau road runs some miles inland and then again approaches the coast west of Hera.

There is good air cover (behind the beach) from east of Dilli to Hera.

Japanese forces, in their attack on the Allied positions in Dilli, followed three main courses after landing at the above beach.

a. A direct attack on the airdrome from the West.

- b. A thrust along the road and south of the road in an attempt to encircle the 'drome.
- c. A smaller force moving up the bed of the Comoro River, climbing the coast range and occupying Lau-Lora and Lahane in an attempt to cut off the Allies' withdrawal.

In any attack on Dilli it would be wise to use the good cover afforded by coconut and banana plantations between the landing beach and the 'drome on the north of the road, and also to seize the coastal range by moving up the bed of the Comoro River. There is little cover through paddy fields to the south of the road.

7. Hera to Cape Fatu Lana—See Photo No. 15:

The coast is reef-bound and unsuitable for landings.

The main Dilli-Baucau road passes close behind the coast. Inland from the road there are rolling grass-covered hills with scrubby eucalypts.

Owing to easy access to the road to Dilli, more detailed information on the nature of the reefs and possibilities of landing thereon in calm weather is necessary before this section can be disregarded as of little importance.

8. Cape Fatu Lana to Manatuto:

Conditions are reasonably favorable for landings over this section. There is anchorage off North Lacro River.

In general, the coast consists of stretches of beach separated by rocky reef-bound headlands. There are longer beaches near the mouth of the Lacro River, where the water is shallow but free from coral. This area was used for landing by the Japanese.

The coastal road passes close behind the beaches, but ease of access to the road is not known. Road crosses Lacro River per ford.

Behind the road there is particularly mountainous country almost as far east as the Lacro River. A precipitous range rises to 4,000 feet (1,200 m.) within 3 miles (5 km.) of the shore. Towards the mouth of the river there is flat open country.

Many short mountain streams, as well as the Lacro River, enter the sea along this section. The Lacro River, including its mouth, is very shallow. Drinking water is not available during the dry season. It may be obtainable by sinking.

9. Manatuto to Salgueiros (Lamsana Salt-pans):

There are favorable landing places at Manatuto and Salgueiros with, in between, a rock-strewn beach with reefs offshore. There are anchorages, somewhat exposed in the northwest season, at both places.

There is a small steep beach, with deep water close inshore at Manatuto. The road is adjacent.

At Salgueiros there is a beach about 300 yards (275 m.) long at the head of a small cove. Approach to the cove is free from reefs.

The beach is of hard sand, about 200 yards (175 m.) wide with very low sand dunes immediately above high water mark.

The beach and dunes are sufficiently hard to take the weight of native carts.

There are low salt pans behind the sand dunes, which flood at high tide. The main north road is immediately inland from the salt pans. Ease of access from beach to road is unknown.

There is no air cover.

10. Salgueiros to Lamsana Bay—See Photo No. 39:

In Lamsana Bay, landings, close to the main north road, are possible in all weathers.

There is anchorage for large vessels outside the bay, and inside there is anchorage for vessels drawing less than 3 fathoms (6 m.) with shelter in all weathers.

East of Salgueiros there is about one mile (1½ km.) of reef-bound coast, before the deep narrow indentation of Lamsana Bay is reached. The entrance is free from coral, but there are scattered rocks in the shallow water towards the head of the bay. There are also rocks along the beach, but these are not thick enough to be an obstacle to landing from small boats. Here also there are salt pans behind the beach.

The main road is less than ½ mile (800 m.) behind the beach. Ease of access to the road is not known.

Trees extend close to the shore all round the bay, and provide good air cover.

Owing to the rocks, the bay is considered unsuitable for seaplanes.

11. Lamsana Bay to Vemassee:

Eastwards from Lamsana Bay there is a small outcrop of reef of about 400 yards (350 m.) in length, and this gives place to about 2 miles (3 km.) of white hard sandy beach, which is broken up by occasional outcrops of coral. This stretch of coast could be used for landings, but only in calm weather. There is a patch of reef about 2 miles (3 km.) long east of this beach, and from here for about 7 miles (11 km.) eastwards to Vemassee is a stretch of sandy beach without coral. Landings could also be effected here in calm weather. The main coastal road lies from 2 to 3 miles (3 to 5 km.) inland from the coast. There are a few native villages in the area, which is definitely arid. There is not very much air cover between Lamsana Bay and Vemassee. The vegetation inshore from the beach is mainly cactus. Water for drinking purposes is scarce.

Vemassee is an exposed anchorage. There are many coral reefs close to the beach, but passage can be found through them for small boats and barges. The beach is about 450 to 500 yards (400 to 450 m.) long, and about 1 chain (20 m.) wide. The sand is hard and white. Behind the beach is fair air cover in the form of casuarinas. There is also much scrubby growth and cactus. A track for pack horses, which could be made suitable for M.T., leads south-west from the beach for about 2 miles (3 km.) to the posto, which is on the main north coastal road.

12. Vemassee to Baucau:

Eastwards from Vemassee for about 5 miles (8 km.) the coast is sandy with reefs inshore and coral outcrops on the sand. Landings could be effected through the whole length of this area in calm weather. The main north coastal road lies about $1\frac{1}{2}$ to 2 miles ($2\frac{1}{2}$ to 3 km.) inland, and the vegetation is scattered clumps of casuarina along the creek beds, with low scrub and cactus interspersed with grassland. This patch of coast is also in the dry belt and water is scarce.

East from this 5 mile (8 km.) stretch is a patch of precipitous reef-bound coast for about 3 miles (5 km.), along which landings would not be possible. From here to Baucau, a distance of about $2\frac{1}{2}$ to 3 miles (4 to 5 km.), the coast consists of small sandy beaches interspersed with reef. Landings could be effected here, but at some risk. The main road is 3 miles (5 km.) inland. Water is scarce, and the vegetation largely cactus and low scrub with grassland in patches.

At Baucau there is good anchorage off the town, in 18 fathoms ($32\frac{1}{2}$ m.), and the sea here is generally calm inshore throughout the year. Anchorage for boats up to 600 tons is about 250 yards (230 m.) offshore, and the K.P.M. boats lie about 450 yards (400 m.) out. Passage through reefs to the beach for small boats is not easy, and it is doubtful whether it should be attempted at night.

The beach itself is from 200 to 250 yards (175 to 225 m.) long and about 1 chain (20 m.) wide. Sand is soft with big stones. There is no wharf and there are no landing facilities. The main north coast road passes $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) inland through Baucau, which is one of the main towns on the north coast of Portuguese Timor. It has about 50 houses of stone and many native habitations. From the coast through Baucau a motor road goes to the Baucau Plateau, which is a possible site for an airdrome. The plateau rises in three steps each 3,000 to 4,000 yards (2,700 to 3,600 m.) wide, and level. Spring water is available here. The road continues to the south coast.

13. Baucau to Laga:

Eastwards from Baucau the coast is reef-bound and unsuitable for landing for about 4 miles ($6\frac{1}{2}$ km.). About 1 mile ($1\frac{1}{2}$ km.) east from this reef area the Seical River enters the sea. The coast from here to Laga is sandy with outcrops of coral. Landings could be effected at any place along this stretch of coast, but care would have to be taken because of the occasional patches of reef inshore.

The main north coast road lies from 1 to $1\frac{1}{2}$ miles ($1\frac{1}{2}$ to $2\frac{1}{2}$ km.) inland and can be easily reached from the beach by foot troops. (M.T.?). Inland and along the road there are low rolling hills, with coral limestone outcrops. These hills do not rise to a height of more than 200 to 300 feet (60 to 90 m.) and should not be a formidable obstacle to movement. This area is on the eastern limit of the dry belt, and the country itself is generally richer and with better air cover. Along the creeks and inland from the beach the vegetation is casuarina. Water is available.

Laga is an unprotected anchorage with many coral reefs inshore. The anchorage is between 600 to 700 yards (550 to 650 m.) offshore, but big boats of the K.P.M. type must lie off from 900 to 1,200 yards (800 to 1,100 m.). Boats of 10 to 12 tons can go within 60 to 80 yards (55 to 75 m.) of the beach. The beach itself is sandy with stones. It is about 450 yards (400 m.) long, about 20 yards (20 m.) wide, and of very soft sand. There is no wharf, nor

are there landing facilities. The northern road is about 200 yards (175 m.) inland.

14. Laga to Laivai—See Map No. 30:

East from Laga for about 3 miles (5 km.) there is a sandy patch of coast with beach broken by reef with landings through the reef passages possible, but difficult. Then there is four miles (6 km.) of reef-bound coast unsuitable for landings. From here to Laivai, a distance of about 5 miles (8 km.), the coast again comprises small areas of beach interspersed with reef. The road lies inland 1 to $1\frac{1}{2}$ miles ($1\frac{1}{2}$ to $2\frac{1}{2}$ km.) from the beach, and the country itself is gently undulating, with patches of casuarina along the creek beds. Away from the streams, vegetation is open forest and grassland. Water is not plentiful, except near Laivai.

Laivai has an anchorage (coral) about 350 yards (300 m.) offshore, but bigger ships of the K.P.M. type lie 600 to 700 yards (550 to 650 m.) out.

There is a reef along the shore, but there are passages through which landings could be effected with local knowledge. The northern road lies close to the shore. No information on type of beach, access to road. Hinterland still undulating country with some air cover.

15. Laivai to Lautem—See Map No. 31:

Except for a patch of reef-bound coast about 3 miles (5 km.) east from Laivai, the foreshore for 8 miles (13 km.) is beach interspersed with coral reef. There is then 3 miles (5 km.) of reef-bound coast to the Malai-Lada River. The main road lies about a mile ($1\frac{1}{2}$ km.) inland from the coast. There is good air cover, particularly for the westerly eight miles (13 km.). Water is available right along the coast.

Lautem is a good landing place, important from a military point of view because of the road running through to the south coast.

Anchorage is about 300 yards (275 m.) offshore in about 11 fathoms (20 m.), the depths decreasing rapidly towards the shore. There are coral reefs off the beach. The beach itself is about $1\frac{1}{4}$ miles (2 km.) long, and of flat hard sand. West from Lautem village to the Malai-Lada River there is a stretch of sand about 18 yards (17 m.) wide, which is level and hard and said to be possible for landing of aircraft. The north coast road passes inland close to the beach. Air cover is good in this vicinity, but it is poor farther west. Buildings in Lautem include 12 stone houses, the largest of which is the customs house. The Japanese landed troops here from flat-bottomed barges.

16. Lautem to Com—See Photos Nos. 85-89:

East from Lautem, for ten miles (16 km.) to Cape Chater, the coast is sand beach interspersed with coral reefs, through which passage could be found for small boats with difficulty. The coastal road lies about 1 mile ($1\frac{1}{2}$ km.) inland along this area with good air cover in patches.

From Cape Chater the coast swings southeast, and is reef-bound for about 8 miles (13 km.). The reef has been uplifted and in places forms a definite reef shelf 60 to 80 feet (18 to 25 m.) high, with a sheer drop into deep water. It is broken occasionally by small patches of beach. Landings would be difficult along this length. The main road comes close to the coast towards Com. The country inland is undulating to steep. Water is available.

At Com there is sheltered anchorage, protected from all weathers, for vessels up to 2,000 tons. The harbor is natural and formed by two long reefs that extend seaward from the beach with clear deep water passage 200 yards (180 m.) wide in between. The beach itself is about 250 yards (225 m.) long and about 45 yards (40 m.) wide with outcrops of coral through the sand. Landings are possible in all weathers.

Com is the terminus of the main northern motor road. A track continues east from Com to Loiquire and a second track south to Fuiloro (Vila de Avis). These are made tracks, but before Japanese occupation were unsuitable for M.T. (Present position?).

The land behind Com is steep hills which give place inland to the Fuiloro Plain, on which the Japanese have now constructed an airdrome. Vegetation is open forest and very low (2 feet or $\frac{1}{2}$ m.), tough scrub with lonthar palm along the creeks.

17. Com to Loiquire:

East from Com for about 2 miles (3 km.) is reef-bound coast, through which it would be inadvisable to attempt landings. Further east to Loiquire is beach broken by reef, through which passage of small boats would be possible, but only with difficulty. Coastal track from Com to Loiquire lies immediately inland from the beach from here, but it goes inland and is very steep before Loiquire. The ground is broken with rolling hills covered with open forest and very low tough scrub. It is easily passable for pack-horses or foot troops.

Loiquere is a possible landing place. There is an anchorage, but no information is available as to anchorage conditions or beach. The Loiquere village is an abandoned posto in the hills south of the anchorage, now a native village with an elevation of about 1,500 feet (450 m.), and it is connected to Loiquere by a track.

18. Loiquere to Jaco Straits:

This is a difficult section of rocky coastline with frequent cliffs. There is an anchorage at Tutuala, which is connected to Fuiloro by a good M.T. road.

There is not much information on landing conditions and nature of coastline, but there is reported to be a small beach 50-80 yards (45 to 75 m.) long below Tutuala, with a track leading up to the village. Reconnaissance on 1st January reported a good jetty and a small settlement with some defences in this area.

Hinterland is steep with sharp ridges and precipitous slopes. Vegetation is dense forest with many sharp limestone boulders. Even movement on foot is very difficult except along the road.

B—SOUTH COAST

1. Dutch Border to Cape Tafara:

There is an exposed anchorage in 6 fathoms (11 m.) off the mouth of the Masin River. Little information is available on the coastline, which is backed by extensive swamps with rice fields in places.

There are no roads or recognised tracks. This section is of little significance.

2. Cape Tafara to include Suai—See Photo No. 4, Map No. 11:

The anchorage off Suai is the best on this portion of the coast, although it is exposed to the South with frequent heavy surf particularly from June to September. Anchorage for larger vessels is in 15 fathoms (27½ m.), southwest from Cape Suai. Smaller craft anchor 150 to 300 yards (140 to 275 m.) off and unload by barges or rafts. There is good shelter for boats just west of the reef.

There is continuous sandy beach for approximately seven miles (11 km.) from Cape Tafara to 300 yards (275 m.) from the mouth of the Tafara River, which is immediately west of Cape Suai, a low point fronted by a wide coral reef. The beach is of hard sand and about 60 feet (20 m.) wide at low water. The main landing beach is immediately west of the mouth of the Tafara River, which is only 40 yards (35 m.) wide and not as shown on the Asia Investment Co.'s 1/250,000 map.

The landing beach is the most suitable on this section of coast and was used successfully by our troops during the southeast season.

This landing beach is near the point of a long sand spit 20 feet (6 m.) above sea level, which separates the extensive swamps near the river mouth, from the sea. There is a large open-sided shed used as shelter for stores, and two stone beacons 20 feet (6 m.) high on this sand spit. Three hundred yards (275 m.) to the rear is an old wooden bridge 40 feet x 8 feet (12 m. x 3 m.), now probably unusable, crossing the main channel of the river, which may be crossed easily at low tide. Crocodiles up to 18 feet (5½ m.) are prevalent here.

North of the river and swamp is the native village—several native huts and one stone building. The posto is east of the river mouth and close to the shore. It is white and conspicuous with a high stone wall and is a likely landmark from seawards. There is a telephone from Suai to Bobonaro through Debos.

3. Suai to Rai-Mean:

Rai-Mean is not marked correctly on the 1/250,000 map. Its true position is 9° 14' S., 125° 29' E., or 5 miles (8 km.) east from where shown.

There is poor exposed anchorage off Rai-Mean.

There is continuous sandy beach broken only by the mouths of three rivers from Cape Suai to Rai-Mean. Offshore there are isolated small patches of reef which dry at low water. The beach is 20 yards (20 m.) wide, of firm white sand and with gradual slope.

Behind the beach there is some swamp with sago palm, then elephant grass and bamboo. Further inland the country rises fairly sharply except towards Rai-Mean, where it is flatter, with many coconut groves.

There is a good track from Suai through Beco to Rai-Mean. (See track 26). It could easily be improved to carry M.T. as far east as the Raimera River. It would be wet after rain, particularly near Rai-Mean. There are also several tracks leading inland, particularly from Suai and Beco.

4. Rai-Mean to Sue River—See Photo No. 17:

There is a continuous sandy beach over this section, fronted by occasional short stretches of reef. The beach is from 20 to 30 yards (20 to 30 m.) wide with hard sand.

Immediately behind the beach there is sago and lonthar palm with much elephant grass.

The hinterland is undulating for most of the distance, but for the last 5 miles (8 km.) to Betano it becomes flatter.

There are no tracks close to the beach.

5. Sue River to Betano to Cape Meti Boot:

N.B.—The coastline from Betano east almost to Jaco Island is covered by Coastal Strip Map No. 2.

The only anchorage with shelter during the southeast season is at Betano, where a reef extending $2\frac{1}{2}$ miles (4 km.) from the point to east of Betano Bay gives fair shelter.

The coastline is largely fringed with reefs, with beaches in between. The most extensive beaches are from Betano westward and at the mouth of the Quelan River.

From Sue River to Betano there is gently sloping sandy beach, usually about 40 yards (35 m.) wide and reasonably hard, interspersed with stretches of fringing reef. Landings would be possible along these sandy stretches in calm weather, but there is no shelter from the southeast except in a cove 1,000 yards (900 m.) east of where the wreck is ashore opposite Betano. Here there is shelter from the reef running seawards from the point immediately east, and also from an offshore reef running parallel to and close to the shore. Here there is a small boat passage 100 yards (90 m.) wide and 300 yards (275 m.) long between two reefs. Entrance can be made on a bearing of 67° . The inner reef is only 50 yards (45 m.) long and bears 59° . The Australian troops landed stores by ships' boats between August and December, 1942, at a point 150 yards (140 m.) east of the wreck. Little difficulty was experienced. At high water seas frequently break right across this reef.

Further east, there is $2\frac{1}{2}$ miles (4 km.) of reef before a sandy beach 150 yards (140 m.) long, at the head of a bay facing a break in the reefs, is reached. This is exposed to the southeast. Then there is a further two miles (3 km.) of uninterrupted reef to the mouth of a small creek 400 yards (350 m.) west of Quelan River. The river mouth is sanded up during the dry season. The beach continues towards Cape Meti Boot less than 1 mile ($1\frac{1}{2}$ km.) east. The Cape is a low, rounded headland with a round beacon 30 feet (9 m.) across. The headland is fringed with wide reefs extending 200 yards (180 m.) from shore.

Behind the line of beach the most frequent condition right along this coast is a narrow strip of marshland from 2 to 10 yards (2 to 10 m.) wide immediately behind the sand. It is fringed with mangrove, casuarina, lonthar palm and some eucalypts. In wet weather these swamps break through the low sand dunes into the sea.

The river mouths consist of a meandering network of creeks forming shallow lagoons with swamp vegetation, behind the low sand-dunes. At times there are narrow openings to the sea, usually with surf breaking on a bar, apparently dangerous.

Inland from the coastal belt of marsh, there is usually flat low-lying country with open forest and grassed patches.

Movement of foot is generally easy, as the trees are widely spaced. There is only one important track, a constructed track from Betano east to South Lacro River.

Water is generally scarce, but is obtainable from springs or, after chlorination or boiling, from some of the streams.

There is an open area which may be suitable for emergency landing grounds three miles (5 km.) northwest of Betano on the upper reaches of a creek which is not marked on the map, but which enters the sea at Betano, 300 yards (275 m.) west of the wreck. The area is 1,200 by 300 yards (1,100 by 275 m.) with one or two scattered trees and lined with she-oaks and eucalypts. It is not well grassed and is likely to be boggy during the wet season. (See Part I, Section III—Airdromes, Para. 4f., iii.).

6. Cape Meti Boot to South Lacro River:

There is no shelter along this stretch. Air photographs reveal that the reefs continue for some miles east of the cape with at one mile ($1\frac{1}{2}$ km.) from the beacon, a break which fronts a beach 250 yards (225 m.) long. There is some habitation in this area. This area is known as Port Alas (see Photo No. 21) and can be used for landing in good weather. There is excellent tropical cover right to the sand.

Further east the shore around the bay opposite Besusu Plain is generally flat and sandy and devoid of reefs to the mouth of the South Lacro River. In the dry season the Lacro delta is completely dried up and well covered with native cultivation areas.

The hinterland is low and swampy with mangrove and other swamp vegetation. It is not certain how far the swamps continue inland. There are no important tracks close to the coast.

7. South Lacro River to Dilor River:

Over this 20 miles (32 km.) there is continuous low sandy beach with no shelter from surf which breaks close in during the southeast season.

The beach is unbroken except for a narrow stream entering the sea two miles (3 km.) east of Sahi River. This is 30 yards (27½ m.) wide, with a bar which appears dangerous. Several rivers and streams enter the sea during the wet season, but their mouths are all sanded up at other times.

Behind the beach between the South Lacro River and Quicras, there are extensive areas of low alluvial flats, often cultivated during the dry season. Further east the immediate hinterland is largely swamps with much mangrove. Further inland there is much open country except near Clerec River and Quicras, where there is dense forest and thick undergrowth.

There are no important tracks close to the shore except at Quicras.

In greater detail, one mile (1½ km.) east of South Lacro River, there is an extensive alluvial fan with a few native huts and cultivated patches. There are similar flats about 5 miles (8 km.) east in the vicinity of the Clerec River. There is one uncultivated patch 350 yards by 800 yards (325 m. by 750 m.) or more which appears usable as an emergency landing ground. It is close to a swamp on a big delta and is likely to be flooded during the wet season. (See Part I, Section III—Airdromes, Para. 4f, v.).

Three miles (5 km.) further east there are thick mangrove swamps immediately behind the beach, which here is high and somewhat shingly. In the center of these swamps, presumably at the Datouk River, there is an open lagoon of clear water about 600 yards (550 m.) long.

Mangrove swamps continue for a further three miles (5 km.) to the mouth of the Sahi River, and for two miles (3 km.) past, where there are wide mud flats. Several creeks draining this area unite into a lagoon with a narrow passage open to the sea as described above.

The mangrove swamps then continue for six miles (10 km.) to the mouth of Dilor River. All this swamp country appears uninhabited.

8. Dilor River to Cuac River—See Photos Nos. 52, 64 and 65:

This is a continuation of the same low shoreline, with unbroken beaches devoid of reefs or outstanding features. Landings by M.L.C. would be easy during calm weather, but the beach is exposed with heavy surf during the southeast season. Access inland from the beach is difficult.

In general, there is usually a belt of mangrove swamps immediately behind the beach. The swamps have an average width of two miles (3 km.) and are fed by numerous streams descending from the high mountains 20 to 30 miles (30 to 50 km.) inland. Between the swamps and the foothills there is a zone of "elevated plains" five miles (8 km.) or so wide and suitable for agriculture, but dissected by wide river courses and dotted with isolated hills. There may be suitable landing grounds in this area.

The mouth of the Dilor River is closed to the sea by the high beach. Its bed averages 40 yards (35 m.) across, but there is scarcely a trickle in the dry season. It enters the coast at an oblique angle running east for the last 1,200 yards (1,100 m.).

Two miles (3 km.) east there is a passage to the sea from a long impounded lagoon (formed by the Vei Lolox Creek) and a network of waterways through mangrove swamps. This passage is scarcely 20 yards (18 m.) across and has surf on the bar. Four miles (6½ km.) further east is another impounded lagoon and network of streams, this time fed by the Luca River.

From the Luca River east there is a marked decrease in swamp and 2½ miles (4 km.) on the Vei Todo River comes straight to the beach in a broad bed 100 yards (90 m.) wide. Between the Luca and the Vei Todo Rivers there is said to be a village with a few huts and a track leading inland.

Cape Luca is 1¾ miles (3 km.) east of Vei Todo River. It is low and inconspicuous with a reef offshore.

The mouth of the Vei Tucu River, 1 mile (1½ km.) east, is open to the sea, although 300 yards (275 m.) upstream a branch flows east, parallel to the coast for 2 miles (3 km.), and does not enter the sea. There is only a trickle of water at the mouth of the Vei Tucu in dry weather. Unbroken sand continues east for six miles (10 km.) to the Cuac River, which is broad and meandering with a well marked flood plain and a small outlet to the sea.

9. Cuac River to Beasso (Beaço)—See Photos Nos. 66 and 67, Map No. 5:

Sandy beach continues for 2½ miles (4 km.) from Cuac River. It is backed by dense forest and patches of mangrove swamps.

Half a mile (1 km.) east of the Cuac is a mud volcano with a crater 200 yards (175 m.) across.

From 3 to 4 miles (5 to 6½ km.) west of Beasso there is a prominent cape with reefs running seawards for 200 yards (180 m.). The reef should provide shelter for landings during the southeast season, to about 100 yards (90 m.) of beach, but access inland appears to be blocked by mangrove swamps.

There is a break in the reef 400 yards (350 m.) east, with a possible landing place 200 yards (180 m.) long opposite the break. Access inland is also difficult because of mangrove swamps. There is a second break one mile (1½ km.) east, which leads on to 30 yards (27½ m.) of white beach.

About 2 miles (3 km.) further east is the main anchorage and landing place of Beasso. Anchorage is exposed to southeast except for small vessels which can obtain shelter between two reefs running seawards 250 yards (225 m.) apart.

The landing beach is 200 yards (180 m.) long, 20 yards (20 m.) wide, and of hard white sand. The beach is free from stones, but the slope is, however, said to be 1 in 10. There are some huts behind the beach, and the Viqueque road approaches the shore and also continues west to Aliambata, running ½ mile (1 km.) inland. Access to road from beach is not known. There is dense timber and very little swamp behind most of this area, and it appears suitable for the construction of landing grounds. The forest is also relatively free from undergrowth and cross-country movement of troops would be easy.

10. Beasso to Aliambata—See Photos Nos. 66-68, Maps Nos. 5, 21:

From the main Beasso anchorage eastward there are shore reefs 200 yards (180 m.) wide fronting a sand strip some 30 yards (27½ m.) wide. The reefs continue for 3½ miles (5½ km.) from Beasso, to less than one mile (1½ km.) east of a well marked cape. West of this cape there is a small break in the reef which may be possible for landings from small boats. The Aliambata-Beasso road runs 200 yards (180 m.) inland along this reef section. There is good air cover behind the beach as the country is covered with dense forest with little undergrowth. There are scattered patches of grasslands and native cultivation.

From where the reef ends east of the cape, a sandy beach extends for nearly 20 miles (32 km.) to the anchorage at Aliambata. It is exposed to heavy surf from the southeast, except at Aliambata, where there is some shelter from Cape Roro-Ai. The sheltered portion is, however, fringed with reef. There is also a fair anchorage here.

There are several rivers along this section, but only two—the Luguasa and the Be-Fui Rivers—have openings to the sea in the dry season, and these are not navigable. At the mouth of the Luguasa River there is a fairly extensive shallow lagoon with a branch stream running eastwards immediately behind and parallel to the beach for more than a mile (1½ km.). This is probably the former course of the river as shown on the Standard Map; it has since cut through to the beach by a more direct route. The Com Creek as shown on the map does not exist.

Further east, the Dara-Bai River has a similar course parallel and close to the beach with its mouth about ½ mile (1 km.) west from that of the Be-Fui River.

There are extensive swamps (mainly mangrove) behind the beach throughout the central portions of this 20 mile (32 km.) stretch. Inland these swamps give way to fertile open grasslands and savannah country with extensive cultivation, particularly further up the Luguasa River. An area of black soil plain 2 miles (3 km.) long E/W by ½ mile (1 km.) wide midway between the Luguasa and Saguito Rivers and just south of the road, appears suitable for an emergency landing ground. Elsewhere there are also patches of dense and open forest. (See Part I, Section III—Airdromes, Para. 4f, viii.).

Behind the western and eastern extremities of this stretch there is dense forest with scattered areas of open country, particularly near the Be-Fui River, and some isolated hills. The forest is close to the beach and provides good air and ground cover.

The Beasso-Aliambata road, which is suitable for M.T. in dry weather, runs approximately 300 yards (275 m.) behind the eastern end, then deviates inland to avoid the swamps, and further west reapproaches the coast between the Be-Fui River and Aliambata, where it is immediately adjacent to the beach. Aliambata itself consists of a few native huts only.

To summarize this section, Aliambata, with a fair anchorage and a beach with some shelter from the southeast and the road immediately adjacent, is the most favorable landing place. The western end, with the beach more exposed, but the road still within easy reach, is also favorable, while the central portions with exposed beach and swampy hinterland are a much less attractive proposition.

11. Aliambata to Elomar—See Photos Nos. 68, 90; Maps Nos. 21, 28:

East of Aliambata, a fringe of old elevated coral reefs line the shore for two miles (3 km.) to the east of Cape Roro-Ai. The motor road to Elomar (dry weather only) continues close behind the beach through steeper country covered with dense forest. At Meta Hou, near Aliambata, there are large numbers of steel drill pipes and casing near an old oil well.

From east of Cape Roro-Ai there is a sandy beach for 18 miles (29 km.) to Elomar and on to Cape Batu Puti (Pedra Branca). Between Elomar and Cape Batu Puti the beaches are broken by several rocky capes. Small lengths of coral reef said to exist are not visible in the photographs. The coast is exposed to the southeast with possibly some little shelter behind reef at Elomar, where there is an anchorage in 4 to 5 fathoms (8 to 9 m.). There is also thought to be some shelter on the beach immediately west of Cape Batu Puti.

There are many rivers along this coast, but only two enter the sea during the dry season. The Wai River has a very small opening, and about 4 miles (6½ km.) west of Elomar the Ira-Bere River, with a bed 150 yards (140 m.) across enters the sea across a bar. Informants state that there is only 3 feet (1 m.) on the bar at high water and that it is not navigable, although in the photographs, which show a moderate surf running on the beaches, there is a 60 yard (50 m.) gap across the bar with no "break" in the surf.

There are frequent swamps behind the beach near the mouths of the numerous streams. Near Elomar and further east the swamps give way to more elevated country. There is also a narrow fringe of casuarinas ("She-oaks") along the top of the sand in places.

Behind and between the swamps there are patches of grassland, savannah and forest country, which becomes denser east from Elomar. Threequarters of a mile (1 km.) east of the Ira-Bere River and south of the road there is a clear area 1,400 yards (1,300 m.) east/west and 500 yards (450 m.) wide. It is 500 yards (450 m.) to the coast across a small stream and swamp. It appears suitable for an emergency landing ground. East from Elomar the country becomes rough and broken with rocky crags and steep sided valley. (See Part I, Section III—Airdromes, Para. 4f, ix.)

The coastal road from Beasso to Elomar is suitable for M.T. in dry weather, although road and bridges may need repair. It runs close behind the shore for 4 miles (6½ km.) from Aliambata, then goes further inland to avoid swamps and streams, passing through Tualo and reapproaching the coast at Elomar and continuing inland to Iliomar.

12. Cape Batu Puti (Pedra Branca) to Cape Loré—See Photos Nos. 91-93, Map No. 32:

East from Cape Batu Puti there are several fairly high rocky capes separating sandy beaches fronting rough, stony country. Three miles (5 km.) east the coast becomes lower, with more sandy beach. The beach then continues with few interruptions to 3 miles (5 km.) west of Saenamo (Dai-Name) when reef patches commence again.

At Saenamo there is good general anchorage with some shelter from Cape Loré, and also a small sheltered area between two reefs running seawards for about ¼ mile (½ km.) and some hundred yards or so apart. Small vessels can shelter here in almost any weather, and it fronts a stretch of good landing beach with deep water close in. There are several buildings on shore and ample cover from the air, with vegetation right on to the beach in places. There is also some small amount of shelter on the beaches between Saenamo and the Mamaluto River, given by the reefs which separate the beaches.

The reef continues for 2 miles (3 km.) southeast to Cape Loré, a well-marked low promontory with a sandy patch on the point and dense vegetation further back.

There are several rivers along this stretch, the largest being the Beira, the Chino and the Mamaluto. The Mamaluto is the largest, with a bed 150 yards (140 m.) across and a mouth open to the sea. There is a bar across the mouth on which surf breaks. Actual depth is not known.

Except west of the Mamaluto River, there are very few swamps. There is dense forest, in places approaching rain forest in luxuriant growth, behind much of the beach. There are also scattered areas of cultivation. The country behind the western section is rough, but further east there is a narrow coastal plain below the foothills. The coastal road runs inland from Elomar to Iliomar. An old road then continues east. It is wide and follows easy grades, reapproaching the shore near the Beira River and continuing along the coastal plain to Saenamo. The road is in very bad condition, with many bad river and creek crossings, broken culverts and boggy patches. It comes right to the beach at Saenamo.

13. Cape Loré-Jaco Straits:

A reef-bound coast runs from Cape Loré right to Jaco Straits, broken only by very short lengths of beach between Cape Loré and Bualeu, at the southern end of Jaco Straits, and some miles west. That at Jaco Straits is one chain (20 m.) wide and of hard white sand.

East of Cape Loré the reef can be crossed at high tide, to reach a sandy beach behind. In May and June landing has been found possible in the morning, impossible in the afternoon. In July and August landing would normally be impossible day or night; while in the northwest season it should always be possible.

Behind the western end the reef is backed by sand, fringed with casuarinas and then dense forest with scattered areas of open country behind. Further east the hinterland becomes steeper and rougher, there are frequent lengths of cliffs, and the vegetation becomes more continuous, with fewer clearings or signs of habitation. The country is alternating sandstone and soft shale, which gives rise to many cliff-like outcrops.

SECTION VII—TOWNS AND VILLAGES

1. Province of Fronteira:

The Province of Fronteira is the most westerly part of Portuguese Timor; the boundary between Dutch and Portuguese Timor is its western boundary. Bobonaro is the provincial capital.

Atsabe (Nova Ourem—See Map No. 7) is 9 miles (14 km.) at a bearing of 28° from Bobonaro. Atsabe is one of the larger postos and market centers, and its buildings number about 20 in all. These stone buildings, most of which have galvanized iron roofing, comprise posto and administrative block, church, school and about 15 Chinese shops. About one mile (1½ km.) along the Lete-Foho road six bamboo huts with thatched roofs are the native soldiers' barracks. These huts are about 10 feet x 10 feet (3 m. x 3 m.) and are evenly spaced. The posto is well covered from air observation and is well timbered on the southwest side. There is a large market square north of the posto and many trees have been planted around the trading area. There is a motor road to Bobonaro which, for one mile, has good air cover. Atsabe was the Australian H.Q. of a platoon from May to August, 1942.

Balibo is 23 miles (37 km.) from Bobonaro at a bearing of 278°. This is a posto town on the main Batugade-Dilli road, and on the Balibo Plateau.

Bobonaro (see Photo No. 12 and Map No. 9) is 35 miles (56 km.) at a bearing of 205° from Dilli. It is at an elevation of about 2,600 feet (790 m.) on the southern slopes of the Ramelau Range and looks south over the valley of the Lono-Mea River.

Bobonaro is a posto town and capital of Fronteira Province. The regular posto buildings are stone and are enclosed by a high wall. On the west side is a row of about 10 Chinese shops and on the north 3 long buildings used as cavalry barracks and large enough for 60 soldiers. There is a small Catholic church to the northwest. There are in addition to many stone houses of the native officials about 100 native huts widely dispersed around the town and along the road leading north to Atsabe. The town has a water supply piped from nearby hills to a small concrete reservoir.

Bobonaro can be easily recognised from the air because two large Maltese Crosses in a background of white stone are set in a large garden plot in front of the posto. These crosses are easily visible and identifiable from the air.

The Chinese quarter of the town is on the northwest of the central square; beneath the trees here a number of slit trenches have been dug.

Bobonaro has a cemetery, which is north of the town and west of the road leading to Atsabe and Dilli.

Cailaco is 9 miles (14½ km.) from Bobonaro at a bearing of 330°. A small posto and market town situated in the ranges. Mt. Cailaco (1,448 meters) stands up prominently on the south of the town. The posto commands an excellent outlook to the Nunura Plains and Lois River. There is a water supply tank at the posto.

Fatu-Lulic (Nova Monchique) is 20 miles (32 km.) from Bobonaro at a bearing of 229°, overlooking the Dutch border. Posto and soldiers' barracks, all constructed of stone with thatched roofs, are well concealed from air attacks from the southeast. There are also Chinese shops and many native villages. This posto takes a fine setting with its nice gardens and avenues of fruit trees. During the early months of 1942, Australian soldiers used all these buildings as barracks. Good food supplies were always obtainable in this district. There is also a good water supply fed to the posto by bambo pipeline.

Foho-Rem (Nova Gouveia) is 26 miles (42 km.) from Bobonaro at a bearing of 224°. Situated high in the ranges of the southwest of the province,

and overlooking Tilomar and Suai Bay. Open grass country in surrounding district. The posto and administrative buildings, also hospital and doctor's residence, Chinese shops, are all made of stone walls. Some of these buildings have galvanized iron roofing. The water supply is reticulated to most of these buildings. The district is fairly rich in rice and maize. It also has its own flour mill.

Lebos is 14 miles (22½ km.) southwest of Bobonaro at a bearing of 225°. A posto and market town, it has a view of both the north and south coast. It is situated high in the hills, most of the day above the clouds, with open grass country in surrounding districts. The only buildings are the posto and administrative block and a few Chinese shops. Tracks lead from all quarters of the island and would be very prominent from the air. Australian troops occupied this posto during the early months of 1942. Water supply is carried from adjacent springs.

Lolotoi (see Photo No. 13) is 10 miles (16 km.) south of Bobonaro at a bearing of 200°. The posto is situated on an open grassed hill and has a commanding panoramic view of the district. There are three stone buildings with thatched roofs surrounded by a high stone wall. This posto is an excellent air and artillery target. Close to the posto, due west, there are a few stone Chinese shops and dwellings situated on the same knoll, also workshop built of native material. South of the posto and on a small made flat are about six bamboo and thatched buildings used as barracks. The water supply is reticulated and a bamboo pipeline brings the water to a point at the east foot of the posto hill, where there is a large irrigated garden. A good food supply is always available; this includes citrus fruits grown on the south side of the posto. Good graded pony tracks lead to the posto from all directions. This town was used as H.Q. for Australians in May to July, 1942.

Mape (see Map No. 10) is 6 miles (9½ km.) southeast of Bobonaro at a bearing of 125°. A posto and market town rich in maize and fruit. The posto and three Chinese shops are constructed of stone. During 1942 Australians used this as Force H.Q., the Commandant keeping supplies up to as many as 300 men on different occasions. It was heavily bombed by Japanese during August, 1942. Mape commands an excellent outlook to the south coast and Bobonaro districts. There are no roads suitable for M.T. in this area, but tracks are well made and suitable for pack transport. Water has to be carried some distance in bamboo pipes by natives.

Maucatar is 17 miles (27 km.) southwest of Bobonaro at a bearing of 209°. A posto town, it commands a good view to the south coast and surrounding districts. The posto is built of stone with thatched roof. The only other buildings are constructed of native materials. Timber is plentiful in adjacent areas and air cover is good approaching the town.

Tilomar is 28 miles (45 km.) from Bobonaro at a bearing of 216°. A posto and market town, it is 650 feet (200 m.) above sea level and commanding an excellent view of the south coast between Cape Tafara and Beco. Fairly open country adjacent to the posto and then well timbered country abounds in all directions. The buildings comprise posto, Chinese shop, barracks, all constructed of stone, while stables and workshop are wood with thatched roofs. It was used as Dutch H.Q. from May to August, 1942, and Australian troops were stationed here for about one month.

Other Important Towns, Not Postos:

Batugade (Caxias de Extremo) is 28 miles (45 km.) from Bobonaro at a bearing of 281°. Batugade is not a posto, although there is a posto residence. It has an anchorage and at present is under Japanese control.

Beco (see Photo No. 6 and Map No. 8) is 16 miles (26 km.) from Bobonaro at a bearing of 162°. It is a small town with old posto buildings and also several buildings used by Chinese traders. Beco was used by the Australians as a dump for supplies brought from Australia up till August, 1942. (These supplies, however, were landed at Suai, 14 miles west by road). Rice, maize and kapok are the main district products.

Dacola is 21 miles (34 km.) from Bobonaro at a bearing of 226°. This is a market town and under the jurisdiction of the Foho-Rem Commandant. The surrounding district is very rugged and the town is practically on the Dutch border.

Debos is 21 miles (34 km.) from Bobonaro at a bearing of 196°. A market town controlled by the Tilomar Commandant. Situated on a knoll on the southern slopes, overlooking Suai Bay, but view obscured by timber to some extent. There are a few stone buildings including administrative block, and church, with a few native huts. Tracks leading to Tilomar, Suai, Cumnassa, and Beco could be made usable by jeeps. Good bananas are grown in the surrounding district.

Fatu-Bessi (Cota-Bot) is 26 miles (42 km.) from Bobonaro at a bearing of 270°. This village should not be confused with the much larger and richer district of Fatu-Bessi in Suro Province. Actually it comes under the administration of Balibo. The village lies just southwest of the mountain of Cota-Bot.

Fatu-Mean (Oliveira) is 28 miles (45 km.) west of Bobonaro at a bearing of 236° overlooking the Dutch border. Stated to be a posto and market town and not very rich in products. It is 2,000 feet (600 m.) above sea level on top of a razor-back ridge in very rugged terrain.

Maliana is 8½ miles (13½ km.) from Bobonaro at a bearing of 278°. It has a large coconut plantation which is its main industry. The branch M.T. road on which it is situated joins the main Dilli road at the Be Bai River.

Marobo is 3 miles (5 km.) from Bobonaro at a bearing of 359°. It is situated in a deep re-entrant at the foot of Mt. Uso Lau. The town is a resort on account of its sulphur springs. It is connected to Bobonaro by M.T. road. There are about 12 stone houses and the town is concealed from the air.

Memo is 11½ miles (18½ km.) from Bobonaro at a bearing of 266°. There is a posto building for the Administrator of Bobonaro, who visits Memo periodically; the building is constructed of stone, with circular turrets at the northeast ends and a stone wall surrounding it. To the North are soldiers' barracks, school and horse stables, and on the southeast Chinese shops mostly built of stone with thatched roofing. Air cover fair.

Suai (see Map No. 11) is 23 miles (37 km.) from Bobonaro at a bearing of 192°, and is situated on the mouth of the Tafara River. This village is controlled by the Administrator of Tilomar, who has a native chief in charge. The native chief's house is built of stone, while several native huts are in the vicinity. There is a possibility that jeeps could be used to travel to Debos, Cumnassa and Beco, but inclined to be boggy in wet weather.

2. Province of Dilli:

The Province of Dilli extends as a long, narrow strip on the northwest corner of Portuguese Timor. Dilli, the capital, is also the capital of Portuguese Timor.

Bazar-Tete (Vila Eduardo Marques) is 14 miles (22½ km.) southwest of Dilli at a bearing of 242°. A small posto town on the southern slopes of the range running through Dilli Province. The posto is situated 3,000 feet (900 m.) above sea level, and has the usual surrounding stone wall. Besides the posto there are a few Chinese shops built of stone with galvanized iron roofs. It is connected to Dilli by M.T. road and joins the main road at Aipelo. Bazar-Tete is usually cloud bound, especially in the afternoons. Australian troops established an O.P. on Cutu-Lau for observation on Dilli and north coast with good results. Water pipeline from small concrete reservoir on Cutu-Lau.

Dilli is the capital town and posto of the Portuguese Colony. Situated 8° 34' S., 125° 35' E., on the north coast, in a large bay, between Point de Motael on the West and Point Fatu Cama on the East. On the South, southeast and southwest, precipitous mountain ranges overlook the town, with a commanding aspect.

The town of Dilli covers an area of about 90 acres. There are many Government buildings and residences built of stone, with a cement plaster finish. With avenues, gardens and coconut palms, this town has a true Oriental setting. At present it is under Japanese control, and is stated to be headquarters of their forces. It has since been subject to heavy Allied bombing and all these statements refer to conditions appertaining prior to Japanese occupation.

The main feature of Dilli is the airdrome, which is situated on the West, and about one to two miles (1½ to 2½ km.) from the center of the town. Its main runway crosses the Dilli-Tibar road.

The chief stone and plaster constructed buildings are pin pointed in Photo No. 16.

Liquissa (Vila de Liquiça—see Photo No. 14 and Map No. 13) is 17 miles (27 km.) west of Dilli at a bearing of 262°. It is situated on the main M.T. road to Maubara, on the north coast, and is a posto and market town. The buildings constitute a posto and administrative block, several Chinese shops, Chinese school, secretary's house, rest house, store house, and church. There is a reticulated water supply which is brought to the town by a pipeline. It is stated that some buildings were erected by the Japanese as a concentration camp for Portuguese civilians.

Maubara is 26 miles (42 km.) from Dilli at a bearing of 262°. This small posto and market town is situated on the north coast and at the terminus of the coast road. The posto itself is constructed on a knoll with its usual administrative and auxiliary buildings. Several buildings were destroyed by floods during

1939. Other buildings are: church, school, and residences, most of which are built of stone with galvanized iron roofing. There is an anchorage on the open beach of Maubara.

Remexio is $6\frac{1}{2}$ miles ($10\frac{1}{2}$ km.) from Dilli at a bearing of 105° . This is a small posto and market town consisting of a few Chinese shops and a number of native huts. The slopes above Hera were used by Australian Forces for O.P. on Dilli from April to August, 1942. Food supplies were plentiful during this period.

Tibar (Nova Alges) is 6 miles ($9\frac{1}{2}$ km.) from Dilli at a bearing of 263° . It is important in that it is situated just off Tibar Bay, and at the junction of the main Dilli-Maubara and Dilli-Hatu-Lia roads. It is also a commanding position from a military point of view, as it overlooks Dilli and the Comoro River. There is a single stone building reported to be a telephone office.

3. Province of Suro:

This Province is the second Province eastward on the south of the island. Aileu is the provincial capital.

Aileu (Vila General Carmona—see Photos Nos. 36 and 37, Map No. 14) is 12 miles (19 km.) south of Dilli at a bearing of 182° from that town. It is the capital of Suro Province and stated to be the prettiest town in Timor. Situated 2,840 feet (870 m.) above sea level, it is built on the west bank of the Saboria River. The posto is situated on the southern end of the town with high walls surrounding it. There are several stone constructed buildings such as barracks, Chinese shops, and Portuguese residences, also the usual numerous native built huts. There is a market square southwest of the town with water fountains in the middle. Trees in the park provide good air cover. A road was constructed from Aileu to Dilli via northern route, but owing to heavy floods in 1939 was damaged to such an extent it was found necessary to build a new road via Taco-Lulic. Aileu is also connected by M.T. road to Mindelo. On this road a concrete bridge was demolished by Australians in 1942. There are numerous paddy fields on both river banks in the vicinity of the town. The district is very mountainous and rugged. There is a good water supply with storage tanks.

Ainaro (see Map No. 15): Also stated to be known as Suro, but no confirmation as to whether this is correct. Ainaro is 20 miles (32 km.) south of Aileu at a bearing of 192° . A large town with posto and market which is held weekly. It is situated on the southern slopes of Ramelau Range and built between two tributaries of the Sue River. The posto is well constructed and surrounded by the usual stone wall. Several stone buildings such as the Governor's palace, administrative block, Chinese shops, church with large spire, priest's residence and incompleated school house, hospital and annex, etc., constitute the town. The streets are well constructed and an old road leads to Maubisse. This road was suitable for M.T. A concrete bridge was demolished by Australians as a road block in 1942 and approaches have been washed away. The road is now in general disrepair.

Alas is 26 miles (42 km.) southeast of Aileu at a bearing of 141° . Situated on the southern foothills, it has a good outlook towards the coast. It is a market town and controlled by the Commandant of Same. There is also a mission station, church, schools and priest's residence constructed of stone with galvanized iron roofs. An old posto built of stone with galvanized iron roof about one mile west was damaged by Japanese aircraft in August, 1942. No persons reside there at present. There are some coconut plantations along the Seissara Creek which flows midway between the posto and mission station in the northeast.

Ermera (Vila de Ermera—see Map No. 16) is 12 miles (19 km.) from Aileu at a bearing of 260° . One of the larger towns in the province. It is a posto and market town situated about 2,000 feet (600 m.) above sea level. The district is very rich in coffee, maize, rice and rubber. The natural vegetation is fairly heavy on the southwest and northern sides, and the mountains, which are very steep, help to give good air protection. The posto commands a good view of the Glano Flats and also the main road which crosses the flat and winds its way round the mountain sides to the posto.

There are about 40 stone buildings, the most important ones being the posto, church, school and Chinese trading shops. A good M.T. road passes through the town to Fatu-Bessi.

Australian troops occupied the town in March and April; Japanese in May and June, Australians July and August, 1942. It is believed to be once again held by Japanese forces. There is a reticulated water system with supply tank behind the church.

Fatu-Cuac (see Photo No. 28) is 31 miles (50 km.) southeast of Aileu at a bearing of 153° and only a few miles off the south coast. It is a small settlement and coconut plantation. Several native constructed huts stand in the coconut

grove. It is 1,000 feet (300 m.) above sea level with a commanding view of the south coast for 10 miles (16 km.) west and 20 miles (32 km.) east. Air cover is good. This village was one of the main camps of Australian troops in 1942.

Hatu-Lia (Vila Celestino da Silva) is 15½ miles (25 km.) southwest of Aileu at a bearing of 251°. A posto and market town situated 1,570 feet (475 m.) above sea level and on the main Dilli road. The posto is on the southern end of the town surrounded by a stone wall. It is stated that the posto itself is made of stone and has a tile roof. There is also a Government rest house (wood and tiles). Other buildings consist of prison (stone and tiles), church, and residence, five Chinese shops (stone and galvanized iron roof) and native clerk's house (stone and tiles). North of the town on the road there is also a hospital and doctor's residence (stone and tiles). Air cover is fair.

Hatu-Udo (Nova Luca—see Map No. 17) is 28 miles (45 km.) south of Aileu at a bearing of 177°. This is a small posto town situated only four miles (6½ km.) from the south coast. Several buildings of stone with galvanized iron and tile roofs constitute the town. These are posto surrounded by stone walls, secretary's house and barracks and Chinese shops. A good water supply is always on hand within a few hundred yards from the posto. The town is exposed to the air except for a few odd trees here and there. There are some small and scattered coconut plantations in the town area. This town was bombed by the Japanese during August, 1942, while Australian troops were stationed there. During November, 1942, it was again bombed by the R.A.A.F.

Lete-Foho (Nova Obidos—see Map No. 18) is 12 miles (19 km.) from Aileu at a bearing of 234°, situated on a high ridge halfway between Ermera and Atsabe. Open to aircraft excepting in a small coffee plantation on the south of the posto. Its buildings are of stone with galvanized iron roofs, and constitute the posto which overlooks 7 Chinese shops, and market square, also the school and teacher's residence (stone and tiled roofs).

A good M.T. road branches from the main Dilli road about 3 miles (5 km.) south of Ermera and leads to the town through the valley north and below Lete-Foho. This town was used as Platoon H.Q. for Australian troops from May to August, 1942. It has a small water supply by pipeline from springs.

Maubisse (see Photo No. 38) is 8½ miles (13½ km.) south of Aileu at a bearing of 162°. Situated on a knoll in a valley of the Ramelau Range. This posto and market town has an M.T. road connecting it with Aileu. A concrete bridge was demolished by Australian troops as a road block. A stone wall surrounds the posto and administrative block. Other buildings are six Chinese shops which are built of stone, also barracks and another small building for officers. Formerly the barracks were large enough to house the whole of the Portuguese Army. There is also a reticulated water supply coming by pipeline from springs and there is a creek west of the town flowing south to the Carau-Ulo River. The district is rich in maize and rice. Natives revolted in this area in August, 1942, killing the Portuguese Commandant.

Same (Vila Filameno da Camara—see Map No. 19) is 21 miles (33½ km.) southwest of Aileu at a bearing of 158°. Situated on top of a hill overlooking the surrounding district. Besides the usual posto, there is the hospital, medical orderly's residence, Portuguese official rest house, secretary's office, telephone office, barracks, four Chinese shops, church, school, prison. Most of these buildings are constructed of stone with galvanized iron roofing. Good made tracks lead north to Mindelo, east to Alas, and south to Fatu-Cuac. This town was heavily bombed and had a considerable amount of action, as it was an outpost of the Australian troops. Same is often called Manufai (native "manu"—poultry, "fai"—pigs), as there were plenty of pigs and poultry in the district. Water supply at this posto is good. The posto is open to aircraft.

Turiscai (see Photo No. 53) is 13 miles (21 km.) at a bearing of 126° from Aileu. It is at an elevation of about 3,500 feet (1,075 m.) in the central mountains and looks south down the valley of the Sue River.

It is a small posto town with the typical posto on a high hill surrounded by wall and gardens. There are some Chinese shops and houses and a few native huts. The town was heavily bombed by the Japanese in August, 1942, and several houses have been damaged.

The surrounding country is fairly heavily timbered and good air cover is available.

Other Important Towns, not Postos:

Betano (Nutor—see Photos Nos. 18-20) is 33 miles (53 km.) southwest of Aileu at a bearing of 161°. This is a small village but important on account of a fair anchorage. The only buildings were the customs house and native huts, some being used for cotton storage. During the latter end of July, 1942,

Japanese shelled Betano from the sea and only skeleton buildings remain. Australian Forces used the anchorage at Betano for several weeks and found it very satisfactory.

Cassa (Arcos) is 24 miles (38½ km.) from Aileu at a bearing of 195°. This village is under the supervision of the Commandant of Ainaro and is situated on the southern slopes of the Ramelau Range. Little is known of its buildings.

Fatu-Bessi is 17 miles (27 km.) west of Aileu at a bearing of 264° and should not be confused with Fatu-Bessi of Fronteira Province (Cota-Bot). Fatu-Bessi is administered by the Commandant of Hatu-Lia. It is high in the mountains above Liquissa with a commanding view of the north coast. It is a very rich center in that it has a rubber plantation besides the usual maize and coffee plantation. The Japanese never interfered with this town as it is said Japanese interests were in the rubber company previous to the outbreak of the war.

These rubber and coffee plantations give good cover to the building center. There are good M.T. roads which lead from the main road to several store houses. The buildings in the town comprise posto administration block, church and several residences, all made of stone. There are also several native-constructed buildings.

Hatu-Builico (Viriata) is 13 miles (21 km.) south of Aileu at a bearing of 195°. This town is under the supervision of the Lete-Foho Commandant. Situated in a valley on the eastern side of Ramelau Range in a rich belt of country. It is 7,000 feet (2,100 m.) above sea level and cold in winter. Good air cover in adjacent area, the only stone-constructed building being the posto, which has the usual stone wall surrounding it.

Good made tracks which are, however, very steep and difficult to traverse, lead to and fro in all directions. This town has a good water supply by pipeline.

Mindelo (Mau-Bessi—see Photos Nos. 24-27 and 29-30) is 15 miles (24 km.) southeast of Aileu at a bearing of 140°. Mau-Bessi is a small posto and market town and must not be confused with Maubisse in the same province. The buildings comprise posto and administrative block and barracks, also a church. The posto is surrounded by trees which give fair air cover. The town is connected to other districts by pony tracks only. There is a good water supply in the district. Australian troops occupied this town during October, 1942.

Railaco is 10 miles (16 km.) from Aileu at a bearing of 290°. This town is controlled by the Commandant of Ermera. A considerable amount of activity between Japanese and Australian Forces left the buildings of the town practically demolished. Formerly there was a building used as administrative quarters and four Chinese shops, which were constructed on the banks of the Railaco River. The main Dilli road passes through the town. Good air cover in town and surrounding districts.

Rai-Mean is 35 miles (56 km.) from Aileu at a bearing of 198° and in the southwest corner of the province; suitable anchorage for small vessels. Good tracks run to Suai, Cumnassa and Beco. Cumnassa has possibilities for air strips. This town was shown on the Asia Co. map 5 miles (8 km.) west of its true position.

Talo is 13 miles (21 km.) from Aileu at a bearing of 249°. Situated on a branch M.T. road, 2 miles (3 km.) from the junction of the Hatu-Lia-Dilli main road. This area is controlled by the Hatu-Lia Commandant. There are a few stone houses and store buildings, constructed of stone with galvanized iron roofing. Coffee and rubber are grown extensively throughout the district. Air cover is very good, as besides the coffee and rubber plantations, natural vegetation is heavy in surrounding district.

4. Province of Manatuto:

The northern portion of this Province is in the dry belt with only a low rainfall and the country is, in the main, arid and unfertile. The vegetation is mainly cactus and stunted forest growth with grass. The Province is only thinly settled. Manatuto is the capital.

Barique is 23 miles (37 km.) at a bearing of 170° from Manatuto. It is built on a flat-topped hill in the southern foothills. There is a good view south down the valley of the Dilor River. It is a small posto and market town. The population is spread around in the surrounding villages. There is a recently-built posto building and an old one now used for the secretary's office, telephone and prison. North of the old posto on an east/west road there are a hospital, barracks, and several other buildings. Behind the new posto there is a water tank fed by a pipe from a spring 200 yards (180 m.) west along the Soibada track. The staple crop is maize with some rice. There are a number of trees around the town and a coconut plantation northwest of the new posto, but air cover generally is not good.

Fatu-Berliu is 32 miles (51 km.) at a bearing of 198° from Manatuto. It is a very small posto town with 4 stone houses and many native villages. The surrounding district is mountainous with grasslands and a fair growth of timber. The productivity of the area is fairly high.

Laclo is 7 miles (11 km.) at a bearing of 246° from Manatuto. It is a posto town of about 20 stone and many native houses on the North Laclo River. There are few native villages in this district, which is rather arid. North of Laclo there is a mountain range of nearly 5,500 feet (1,675 m.) elevation at its highest point; the crest of this range is only 3 miles (5 km.) north of Laclo. An old motor road passed through Laclo for Manatuto to Meti Naro and Dilli. It is now fallen into disrepair and is only traversible by horse.

Lacubar is 18 miles (29 km.) at a bearing of 203° from Manatuto. It is in the valley of the Sumasse River on top of a gentle slope rising from the river. It is a small posto market town and mission station. The posto is at an elevation of 3,000 feet (900 m.) and behind it on the West the mountains rise a further 500 feet (150 m.). The posto is on a fairly open plain about half a mile (1 km.) in diameter. The mission is about half a mile (1 km.) on the east side of the river opposite the posto. There are a few stone houses in the town and several native villages. The Chinese shops have been destroyed by bombing. There are rice and tea plantations in the vicinity of the posto.

Lacluta is 21½ miles (34½ km.) at a bearing of 155° from Manatuto. It is a small posto town of 3 stone buildings and numerous native huts. It is situated in the southern foothills and overlooks the Luca Valley. The surrounding district is fairly hilly and fertile and there are many small villages of two or three huts. There is a fair growth of forest and patches of open grassland in the district.

Laleia is 11 miles (18½ km.) from Manatuto at a bearing of 96°. It is on the west bank of the Laleia River at its crossing with the north coastal road and is a small posto town of 6 to 7 stone houses and 100 others. There are paddy fields and coconuts along the river valley, but inland the vegetation is mainly cactus, scrubby eucalypts and grassland.

Manatuto (see Photo No. 54 and Map No. 20) is 30 miles (48 km.) at a bearing of 84° T. from Dilli. It is east of the North Laclo River and on the coast.

Manatuto is the capital of its province and is a posto town of about 30 to 40 stone houses. The posto is on a dominating conical hill which slopes gently northwards to the beach. Most of the town is built around the foot of this slope, but also extends a short distance along the coast eastwards to another isolated ridge which runs down to the sea. The two hills and town area have a fair amount of air cover from trees.

Manatuto is important in that it commands a major road junction. The main motor road runs east/west through the town, and another runs inland between the posto hill and the river to Cribas with a horse track to Laclo.

The area surrounding the town and two hills is absolutely flat and is covered with paddy fields (sawa).

Soibada is 25 miles (40 km.) at a bearing of 191° from Manatuto. It is a Roman Catholic Mission, high up (2,000 feet; 575 m.) on a southern spur of the main mountain backbone of the island, giving a fine view of the Sahi River, east, south and west.

On the northwest of the cross-roads are the Roman Catholic Church, girls' school, convent and priests' houses; on the northeast corner is a telephone office. The rest house, hospital and native huts are in a group south of the corner. Most of the buildings are of stone.

The surrounding country is fairly rich with interspersed timber and grassland.

5. Province of Sao Domingos:

Baucau is the provincial capital.

Baguia is 17½ miles (28 km.) at a bearing of 129° from Baucau. It is situated on a hilltop on the east flank of the Mata-Bia Range (over 7,000 feet; 2,100 m.), which runs north/south across the back of Timor in the east part of Sao Domingos Province. Baguia, at an elevation of 1,400 feet (425 m.) overlooks the upper valleys of the Seli-Bere River.

It is a posto and market town. The high posto wall includes the secretary's office and barracks. North of the posto there is a new Roman Catholic Church (partly constructed) near the old one and a rest house nearby. South of the posto are market shed, stable, coolie barracks, hospital, storehouse and school. The posto is surrounded by a garden; there are coconut plantations to the North and South.

Baucau (see Maps Nos. 22 and 23) is 60 miles (96 km.) at a bearing of 85° T. from Dilli. It is the capital of Sao Domingos Province and about 1 mile (1½ km.) inland from the north coast. It is an important area on the north

coast because it is situated at the junction of the north coastal motor road and the motor road which crosses the island and leads to Beasso on the south coast. The town is in a narrow belt of low hills which border the northeast corner of Salazar Plain. It is a posto town of about 13 stone houses and many native huts. There are patches of good air cover in the vicinity of the town. As the town is in a limestone area there are many caves which can be used as air raid shelters.

Calicai is 12 miles (19 km.) at a bearing of 124° from Baucau. It is at the end of a spur road which branches south, from the north coast motor road. It looks west over the valley of the Mau-Fui River.

It is a small posto town with a few stone houses and many small native villages. The district is fairly fertile; there is much grassland and forest.

Laga is 11 miles (18½ km.) at a bearing of 94° from Baucau. It is on the right bank of the Laga River and near the river mouth. There is an important anchorage here. The fact that the north coastal motor road goes through the town, and that it is the junction of the inland road to Baguia, increases its military importance.

Laga is a posto town and has two posto buildings; the new one is on the east of the old one which is used for a Government office. There are several Chinese houses, some in the main group of houses north of the posto, and some in a group on the East. The narrow coastal strip north of the town and the strip of western river flats comprise extensive paddy fields. There are three native villages across the Laga River west of the town.

Ossu (see Photo No. 83) is 20 miles (32 km.) at a bearing of 191° from Baucau. It is on the southern slopes of the mountains and looks south down the Vei-Bere River. The north/south motor road crossing the island goes through the town.

It is a posto town of about 4 stone houses and several native huts. The main road near the posto runs north/south and the houses and huts are mainly on the east side. There is a large area of rice fields west of the road, and river tributaries wind about through them. North of this area the main road to Baucau turns west for ½ mile to a point where a short road runs southeast to a cluster of buildings; these include a Roman Catholic Mission, Church, and school. Also from this road junction a bamboo pipe system leads water from an aqueduct to the posto.

Uato-Lari (Leca) is 22½ miles (36 km.) at a bearing of 159° from Baucau and about 4 miles (6½ km.) inland from Aliambata, on the south coast. It is a small posto town on a steep hill about 500 feet (150 m.) above sea level and overlooks the Be-Fui River.

There are two posto buildings, an old and a new, within the posto wall. The secretarial and telephone offices, native houses and Government store-houses are south of the square in front of the posto. The town has a concrete water reservoir. Fairly dense forest covers the surrounding hills and valleys. The population of this area is small and scattered. The following roads lead out of the town; southwest to Aliambata, west to Ossu and Aflicai-Leca (horse track), east to Tualo and Loitafi.

Venilale (see Photo No. 84 and Map No. 26) is 18 miles (29 km.) at a bearing of 205° from Baucau. It looks west over the valley of the River Vemassee, and the north/south motor road from Baucau passes through it.

It is a small posto town with the usual administrative buildings and barracks standing back from the road. There are about 12 stone houses and many small native villages. A fair quantity of maize is grown in the area. The vegetation is often forest and grass. The surrounding country is very mountainous.

Vemassee (see Map No. 26) is 20 miles (32 km.) at a bearing of 256° from Baucau. It is on the coastal plains about 2 miles (3 km.) from the sea and on the east bank of the Vemassee River. This locality is part of the dry region. The north coastal motor road fords the river and runs east through the town.

Vemassee is a posto town. The posto is 200 yards (180 m.) east of the river and south of the coastal motor road. The houses of the town are along both sides of the coastal motor road in a row; this row begins north of the posto and runs for about 400 yards (350 m.) east, when it changes to the north side of the road and continues for another 400 yards (350 m.).

Viqueque (see Photo No. 82 and Map No. 27) is 29 miles (46½ km.) at a bearing of 191° from Baucau. It is on the important Baucau-Beasso motor road, and about 7 miles (11 km.) from the south coast. It stands on an alluvial plain of the right bank of the River Cuac.

Viqueque is a posto town of about 10 stone houses and several native huts. The river flows from the north of the town and sweeps via the east side to the southwest quarter of the town before it proceeds south. The old posto in the northeast of the town is used as a hospital; it is so close to the river

that the wall has been partly destroyed by floods. The new posto is about 150 yards (140 m.) south, and is at the junction of the main motor road and the road west to Laclubai.

There are three coconut plantations, one just southwest of the town and the other two over the river, one north and the other south of the town. There are a number of cultivated fields and a pineapple plantation.

The main road to Beasso crosses the river by a wooden bridge (12 spans, 12 feet wide), but an alternate route to the other side of the river makes use of a ford.

6. Province of Lautem:

The Province of Lautem is on the extreme eastern end of Portuguese Timor. On the west side of the Province there is a high mountain range with many branching spurs running roughly north and south. This range falls away to the East to the Fuiloro Plain. Lautem is the provincial capital.

Com (see Photo No. 89) is 10 miles (16 km.) at a bearing of 87° from Lautem. It is on a small bay which is a useful anchorage with hills directly behind. The Ililuro, a small stream, enters the bay from the hills. The vegetation is scrubby on the coast, but dense inland.

It is a posto settlement of little importance, the posto being by the shore on the south of the bay. On the west side of the bay is an abandoned customs house and 100 yards (90 m.) further west a native village of about 10 huts. The population of the area is quite small. About 200 yards (180 m.) south of the posto is a spring from which a bamboo pipe brings water to the posto. There is a coconut plantation southwest of the posto. *Com* is the eastern termination of the coastal motor road, but a horse track leads east along the shore to Tutuala.

Fuiloro (Vila de Avis—see Photo No. 3) is situated 9 miles (14½ km.) at a bearing of 117° from Lautem. It is in the northwest corner of the Lautem Plateau which extends 8 miles (13 km.) south and 12 miles (19 km.) east at 1,400 feet (425 m.) above sea level.

It is a posto town of 200 inhabitants with a large market. North of the market square is a large building used formerly for a hospital, but now as the *Chefe de Posto's* residence. South of the square is the typical old-fashioned posto. The secretary's office, telephone and prison are west of the square. The Japanese airdrome is immediately west of the town.

There is a very good spring northeast of the town in the bed of a stream; it can be reached by a short road. There is no reticulation system and all water has to be carried. The region is dry and dusty in the dry season, but has plenty of rain in the wet seasons. The vegetation is limited to short or long grass, and air cover is very poor except for a few large trees about the square.

Iliomar is 24 miles (38½ km.) at a bearing of 193° from Lautem. It is a posto town on the northwest of the hills behind Cape Batu Puti on the south coast and overlooks the Lio Ulo River valley.

The telephone is connected to the posto, north, west and northwest of which is a group of Government buildings (district offices, rest house, doctor's house, hospital and store). The native huts and barracks are scattered between these two groups; the market is south of the posto.

The surrounding country is poorly populated but thickly timbered with massive trees and bamboo. On the coast five miles southwest of the town is the Elomar anchorage. This is 28 miles (45 km.) at a bearing of 197° from Lautem. There are seven native huts and a beacon. Water is said to be plentiful.

Laivai (see Map No. 30) is 12 miles (19½ km.) at a bearing of 254° from Lautem. The town is on the north coast on a narrow coastal plain which stretches 1½ miles (2½ km.) west to the Laivai River. Many irrigated paddy fields cover this area.

Laivai is a posto town and anchorage. The posto is built on top of a flat hill about 200 feet (60 m.) above the surrounding plain. To the East are the secretary's office, armory and telephone. The posto is set in a wide compound with a low wall. On the beach north of the posto hill is a customs house recently used as a storehouse. To the northwest on the beach is a ship's beacon, and further west a native village of 15 huts. South of it are some Chinese shops and between them and the posto hill a small park. South of this park there is a Chinese school on the edge of the hill. There is at the posto a well from which the town water supply is drawn.

The road from Baucau to Lautem goes through the town on the north side of the posto hill; there are ramps up the east and west sides to the posto. About 1½ miles (2½ km.) east along the road to Lautem there is a big coconut

plantation, a village and a cemetery. Bombings in the latter part of 1942 have destroyed the posto and many other buildings.

Lautem (see Photo No. 85 and Map No. 31) is 93 miles (149 km.) at a bearing of 82° T. from Dilli and is the capital and chief posto town of Lautem Province. It is built on the alluvial flats at the entrance to the narrow valley in the foothills which come steeply down to the sea. The rocky limestone hills come almost to the water's edge; they are fairly well covered with scrub.

Lautem is a fair sized town with a population of about 500, including Portuguese, Chinese and natives. It is an important commercial and market center and a useful anchorage; the export trade is with copra, oil, rice, and maize.

On the flat-topped hills west of the town there are three groups of old fort-like buildings. The most southwesterly group is the administrative posto and subsidiary buildings; a few yards northeast is the telephone hut and a long building containing the secretary's office and armory. The second fort-like enclosure is north of the posto overlooking the town; the house is used for a school. The third group is north of the school and just above the beach; it contains a hospital and prison. The bulk of the town proper consists of about 10 Chinese shops and about 20 native houses. East of the shops there are a number of stone houses for Portuguese civil servants, and further east a stone customs house and cemetery. There are extensive vegetable gardens on the flats in the valley and maize and sweet potatoes were plentiful. There is a spring half a mile (1 km.) southeast of the town and another half a mile (1 km.) south of the town. A pipe leads from the latter to a reservoir near the school, a branch line going to the posto.

Loré is 21 miles (33½ km.) at a bearing of 158° from Lautem. It is built on the southern foothills about 3 miles (5 km.) north of Cape Loré and is served by the anchorage of Saenamo. The country is hilly and covered with fairly dense forest.

It is a posto town with a very small population. The posto consists of a residence, kitchen and storeroom. It is surrounded by a coconut plantation, and west of this a maize plantation. South of the posto is a rest house, stable and store shed. There are several native houses along the Saenamo road, and, along a track running southeast, some Chinese shops and a native village. North of the posto is a small stream from which water is brought in a bamboo pipe to a concrete water tank next to the posto.

Tutuala (Nova Sagres) is 25 miles (40 km.) at a bearing of 93° from Lautem. It is a small posto outpost in a wooded area at the eastern tip of Timor and is built at an elevation of 1,300 feet (400 m.) on a spur overlooking the sea. On the northeast a precipitous cliff falls sheer to the sea; on the southwest is a small lake, Lake Mau-Pitine.

North of the posto is the secretarial office with telephone; in the northwest is an old posto building now used as a residence. The local population is very small. Water has to be carried about 2 miles (3 km.). The road to Lautem leads west from the town; there is also a horse track southwest to the lake.

Uato-Carabau (Nova Bemfica) is 26½ miles (42½ km.) at a bearing of 215° from Lautem. It is in the southern foothills on a spur 2 miles (3 km.) east of Uato-Rusa (4,000 feet; 1,200 m.) and overlooks the valleys of the Ira-Bere River, northeast and south.

The posto is surrounded by a rest house, barracks, Rajah's house, native houses, market and Roman Catholic Church.

Other Important Towns Not Postos:

Mau-Pitine is situated 16 miles (25½ km.) at a bearing of 127° from Lautem. It is a village in the hills which overlooks the Fuiloro plains from the South. There are a rest house, native huts and a big maize plantation. It is under the jurisdiction of Fuiloro.

Silvicola (Vei Laivai) is 22 miles (35 km.) at a bearing of 167° from Lautem. It is a lumber camp and sawmill about two miles inland from the Saenamo anchorage at an elevation of about 450 feet (140 m.). The exact location is doubtful and it is not clear whether the native name Vei Laivai denotes the mill or the district.

At the settlement there is a Government sawmill stated by different informants to have been driven by steam or crude oil. On the north side of the settlement is a large cattle compound with a shed in the corner. (Buffaloes are used for hauling). The timber used to be exported to Dilli from Saenamo. The settlement is southwest of the Loré posto by which it is administered. There is a concrete reservoir (east of the mill office).

SECTION VIII—ROADS AND TRACKS

(See Map No. 1)

1. General:

a. Roads:

There are relatively few motor roads in Portuguese Timor. The road system consists mainly of a road along the entire north coast, running close to the seaboard. From this, several spur roads run inland, and at only two places is crossing of the island possible by road. These roads are all suitable for M.T. in dry weather and some are suitable for M.T. in wet weather.

Before the Allied and Japanese occupations of Dilli, the meager road system of Portuguese Timor was kept in reasonable order by the efficient Portuguese use of the natives. Between July and November the road between Balibo and Hatu-Lia could be used, and a taxi service was in operation between Koepang, Atamboea and Dilli. Great damage was done, however, to the roads and bridges in the Province of Fronteira during the great floods and earthquakes of 1939. The road from Hatu-Lia to Bobonaro was not subsequently repaired. East of Dilli the road along the north coast and its offshoots to the South were not affected. The road from Dilli to Maubara, although damaged, was subsequently repaired. Immediately prior to the Japanese attack, the natives, who had no interest in maintaining roads, helped to mine or demolish roads and bridges with great glee. However, except for the landslides and demolitions near Hera, the Japanese had no great difficulty in using these roads for M.T.

Because of the contorted mountains and the torrential rains between November and March, the making and maintenance of well-graded roads among the mountains would be a first-class engineering feat. Consequently the main road from Dilli to the eastern end hugs the coastal fringe as does also the road from Dilli to Maubara. This north coast road varies from A1 to B2.*

Apart from the excellent new B1 road from Taco-Lulic to Aileu, and the good stretches of road from Villa Maria to and from Balibo to Batugade, the remainder of the road system is at best B2 and in parts unusable for M.T.

Most of the roads are surfaced with coral, limestone or pebbles, although the "road" across the Nunura Plains has a pure earth surface. Some mountain roads are buttressed with poor Portuguese cement walls in a vain attempt to prevent landslides during the wet season. All roads have innumerable concrete culverts and small bridges across streams and the heads of re-entrants. Larger streams or gullies have bridges constructed of wooden logs covered with earth. In rare instances there are substantial concrete bridges across the large rivers. The bigger rivers form the main obstacle to the maintenance of roads, but can be easily forded when the floods subside anything from two hours to two days after a downpour.

b. Made Tracks:

There is a well-developed system of constructed tracks, usually from 4 to 6 feet (1 to 2 m.) in width, but occasionally as narrow as 18 inches. There are frequent cuttings as the tracks "sidle" around mountain sides in following the contour as closely as possible. They also follow spur lines where practicable. In some cases there are steep grades, but in general they climb gently.

There are frequent blockages during the wet season owing to landslides, but repairs can be rapidly carried out as a rule.

The normal made track is suitable for pony traffic, but not for M.T. or jeeps. It is important to note that in many cases they could relatively easily be widened to take jeep traffic. Average rate of travel on foot or pony is from 2 to 3 m.p.h.

c. Unmade Tracks:

There are also innumerable unmade tracks varying from native pads to well-marked tracks. The more important are shown on Map No. 1. In general they are suitable for foot traffic, and sometimes not passable to pack-ponies. In the absence of local knowledge, a native guide is essential in following these tracks. The cover from air observation for moving troops is generally better along the native tracks than along the roads and remnants of roads.

2. Roads:

Road 1—Dutch Frontier to Dilli:

DUTCH FRONTIER TO NUNURA:

Time of travelling for a marching section from Batugade to Balibo—3 hours.

* The traffic capacity of roads is assessed on basis of width (letter) and load limit (numeral), thus:—

Width

A road is wide enough to carry two streams of transport, passing comfortably without reduction of speed.
B road is wide enough to carry two streams of transport, but only with difficulty—reduction in speed being necessary in passing.

C road, one stream of traffic only. In order to pass, one vehicle must leave road.

Load Limit

1 road and structures capable of standing up to sustained traffic of up to 5 tons.
2 road and structures capable of carrying light M.T. (utilities or staff cars) only.
3 unsuitable for ordinary M.T., but passable to "jeeps."

This is one of the older roads and has an excellent limestone surface. Until it nears Nunura the road is B1. The road from Atapoepoe to Batugade is a good B1 coastal road with scanty cover from the air. From Batugade to the posto of Balibo, on the eastern rim of the mountains surrounding the Balibo Plateau, the road rises sharply, and winds round many re-entrants. There were innumerable wooden bridges and concrete culverts, and, after the first mile ($1\frac{1}{2}$ km.) from Batugade, the cover from the air was excellent, large gum trees and granite boulders marking the course of the road. Every bridge and culvert and many trees and boulders were blown by our troops at the beginning of August, 1942. The road had not been repaired by the time the Japanese began their big military drives, and because of this the Japanese were unable to use any A.F.V.'s or M.T. in the border regions.

From Balibo, which is the highest point of the road, there is an O.P. on the Atamboea 'drome. The road from Balibo to near Nunura is B1 and, because of the solidity of its bridges, culverts, cuttings and embankments, it would be very difficult to damage. Cover from the air is sparse except for a section one mile ($1\frac{1}{2}$ km.) from Balibo, where a grove of tropical trees surrounds a prolific mountain spring. The road winds down around the heads of re-entrants until about one-third of a mile (500 m.) from Nunura, where it is completely blocked by landslides. This was the furthest point reached by the Japanese in 30-cwt. Australian trucks prior to August, 1942.

It is impossible and suicidal to attempt the crossing of the Be-Bai River near Nunura, either by M.T. or on foot, during the rainy season. Considerable labor would be needed before the banks of the Be-Bai could be levelled off for M.T. crossing at the beginning of the dry season. Time of travelling from Balibo to Nunura— $2\frac{1}{2}$ hours.

NUNURA TO MAROBO RIVER CROSSING:

Time of marching from Nunura to the Marobo River—9 hours.

This road, which the Portuguese used to repair about July each year, runs across the Nunura Plains. The plains are mosquito infested and covered with 15 ft. (5 m.) high cutting grass and palms which gives excellent cover from the air. The plains are uninhabited except for the tenders of the rice fields along the Bulobo River. The course of the road is very difficult to follow as it is completely overgrown and crossed by many streams draining from the Cailaco Range into the Be-Bai River. (When the rainy season ends there are many bridges to be repaired). The road runs much closer to the Be-Bai River than is shown on the map, in fact, immediately to the west of the Bulobo River crossing the 500 yards (450 m.) wide Be-Bai River has eaten out a complete portion of the road.

The Bulobo River could be crossed easily by M.T. or foot during the dry season, but could only be crossed on foot at certain times during the rainy season. From the Bulobo River to the Marobo River the road needs much repair in bridges and surface after the wet season. The Marobo River crossing is also impossible for M.T. during the rainy season and could only be used after much labor in the dry season. The Marobo River at the crossing is approximately 500 yards (450 m.) wide, and even during the dry season the river flows in five or six deep channels which makes M.T. crossing difficult though track vehicles could cross easily.

MAROBO RIVER CROSSING TO HATU-LIA:

This was one of the worst stretches of road in Portuguese Timor. There are reports that it has been repaired by the Japanese. From the crossing, the road leads southeast along the rice flats of the Marobo River until the rice flats of the Garrai River are reached.

This section of the road is flooded during the rainy season and afterwards does not look much like a road. From the Garrai River the road climbs north past the Portuguese coffee plantation of Goona-Muto to Hatu-Lia. The road had been washed away and creviced by the rushing tributaries of the Marobo River. There are also several large landslides. Time of travelling—5 hours.

HATU-LIA TO JUNCTION FATU-BESSI ROAD (ERMERA ROAD), approximately 20 miles (32 km.):

Road suitable for M.T. in dry weather. Traffic delayed by floods and bogs after heavy rain. Road is metalled and wide enough for M.T. to pass, except across the frequent short bridges. Some, including a 30 ft. (9 m.) concrete bridge $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) west of Villa Maria were demolished. Villa Maria is a small hamlet of six houses 3 miles (5 km.) east of Ermera.

Ermera is approximately one mile off the main Dilli road on the Fatu-Bessi road (see 1B). The roads in this vicinity wind through steep country, with frequent bridges, some of which are non-detourable. Air cover is poor.

JUNCTION FATU-BESSI ROAD TO TIBAR:

Approximately 40 miles (64 km.). Good metal road capable of carrying sustained heavy traffic except when floods render fords uncrossable. From the

Ermera turnoff (approximate height above M.S.L. 2,000 feet; 600 m.) the road is narrow and windy and suitable for demolition, particularly at one spot (known as "the slip") six miles ($9\frac{1}{2}$ km.) by road from Ermera. The Glano flats are reached $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) south of the Glano River. The road here is built up and in excellent condition. Rice fields normally extend down the river to the mouth of the Lois River, and much maize is grown further upstream. There is a three-span reinforced concrete bridge 150 feet (45 m.) long across the Glano River. One span was demolished and heavy Japanese traffic has been using a detour.

Taco-Lulic is at the junction of the Aileu road one mile north from the Glano River.

The road continues through hilly country up a steep grade of 1 in 6 to the saddle of Nasuta. Beyond Railaco there are three crossings of the Railaco River and tributaries. Traffic is not long delayed, however, as the river, as is usual in Timor, has a wide bottom and is shallow. After Nasuta the road winds down around many re-entrants until it enters a river bed and joins the Dilli-Maubara road at Tibar.

All bridges and culverts, including a bridge at Three Spurs, between the Railaco River and Tibar, were demolished but have since then been repaired.

TIBAR TO DILLI:

About 8 miles (13 km.). This portion of the road is trafficable for M.T. at all seasons of the year. It will carry two streams of traffic. In places it is right at the water's edge, the sides being revetted to avoid encroachment. At Tibar Headland the road is subject to interruption by landslides. About 6 miles (10 km.) from Tibar there is a crossing of the Comoro River, which is about 400 yards (360 m.) wide. When the river is in flood this crossing cannot be used. It rarely remains in flood longer than two or three days, after which time motor traffic can effect a crossing. The river is constantly changing its course and depth and is capable of flooding the enlarged Dilli Airdrome. There is a narrow cutting 20 feet (6 m.) deep and 80 yards (75 m.) long about $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) west of the river. This cutting is said to be not detourable and a suitable demolition point. On the south side of the road, halfway between Tibar and the Comoro River, is the area known as Cactus Camp. This area is about $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) long by $\frac{3}{4}$ mile (1 km.) wide and besides much cactus encloses three bitter salt lakes. A.F.V.'s and M.T. using the coast road could use this area for concealment.

1a. Road Fatu-Bessi to Punilala:

Motor road not shown on map.

1b. Road Fatu-Bessi to Eastwards:

Distance about 6 miles ($9\frac{1}{2}$ km.).

This road traverses a ridge crest and is a spur off the main trunk road from Dilli. The country here is open, hilly and poor air cover.

1c. Road Ermera to Lete-Foho:

This road branches off the main Dilli-Ermera Road 2 miles (3 km.) north-east of Ermera. It travels northeast up a grade of 1-10, then follows a ridge crest before turning south into a valley which it follows for three miles (5 km.). It then rises to Lete-Foho. There is some air cover, particularly near the turnoff. It is quite a fair road, but demolitions were carried out over the last $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) to Lete-Foho. It is reported that repairs have been carried out. The road then continues towards Atsabe. It was completed almost as far as Garrai River in 1941; remainder good horse track but very steep.

1d. Road Garrai River to Bobonaro:

GARRAI RIVER TO ATSABE:

A road at one time connected Atsabe with Hatu-Lia. Owing to washaways and lack of maintenance, this road is untrafficable to M.T. It could possibly be put into repair with suitable labor and equipment in a short time. From Bobonaro to the south coast the only means of transport is by pack animals along made tracks. There are no M.T. roads.

Natives reported that the Japanese were using M.T. from Bobonaro to Dilli in December, 1942.

ATSABE TO BOBONARO:

This comparatively short section of road crosses and recrosses broken ground with many creeks and re-entrants for 8 to 10 miles (13 to 16 km.). There are many hairpin bends and sharp turns along this stretch of road. Until it turns west and traverses a ridge crest it would present difficulty to any M.T. of 30 cwt. or over, and other reports state that certain repair work would be necessary before use. Along the ridge crest to Bobonaro, a distance of about 7 miles (11 km.), it is fairly easy going; the steepest grade would be about 1-5 or 1-6. There is practically no air cover.

1e. *Road Maubara to Tibar:*

This is a coastal road suitable for motor traffic in dry weather. It lies nowhere more than $\frac{1}{2}$ mile (1 km.) inland along the north coast, and though there are many small creek crossings these should not cause delay of more than an hour or so after heavy rain. Near Aipelo the road is cut through solid rock along the seaward side of a small cliff. This cutting extends for 500 to 700 yards (450 to 650 m.) and is a suitable demolition point.

1f. *Road Taco-Lulic to Aileu:*

This road branches off the Hatu-Lia-Tibar section of the trunk road, about 5 miles (8 km.) south of the Railaco River crossing. Its point of departure from the trunk road is at a Portuguese house called Taco-Lulic. The road from Taco-Lulic to Soloi at the junction with the old Dilli-Aileu road is one of the best roads on the island. Varying from A1 to B1, the road runs along the south side and then the north side of the ridge, running parallel with the Glano River. The road winds up for approximately 8 miles (13 km.) with little cover from the air until it reaches the trig. point marked 1,320 on the map. It then winds down to the Soloi rice fields. There are many concrete culverts and bridges marked 1941. These would not be worth blowing up as detours would be easy. The Taco-Lulic-Soloi road would be difficult to damage and is an all-weather road. After Soloi, landslides could be started and bridges blown with effect, for the old Dilli-Aileu road is crumbling in many places.

1g. *Road Aipelo to Baqar-Tete:*

Motor road constructed over northern half. Remainder suitable for horses. Motor car once traversed whole road in dry season. Wide road from Aipelo to foothills, then rises sharply—3,000 feet (900 m.) in 5 miles (8 km.). Narrow dangerous hairpin bends subject to landslides.

1h. *Road Bobonaro to Marobo:*

An excellent B1 road right up to the sulphur baths.

1i. *Road Aileu to Maubisse:*

This road has probably been repaired since the blowing of the bridge over the Dai Soli River. Without a great deal of labor a B2 road could be created.

1j. *Road Nunura to Maliana:*

This road and its offshoot to Memo go straight across the Nunura Plains. Cover from air is good. Although all bridges are broken and the surface of the little-used road is poor, it would take only a few days to repair it and make it B1.

1k. *Road Dilli to Aileu:*

The old Dilli-Aileu road marked as a first class road on the map no longer exists except for a strip $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) from Dilli to the Comoro River and a 2 mile (3 km.) stretch to the north of Soloi. Not even the ingenuity of the Japanese could mend this road ravaged by the Comoro River.

Road 2—Dilli to Baucau:

DILLI TO MANATUTO:

Forty to forty-five miles (64 km. to 72 km.). In Dilli itself one street is sealed with bitumen and reasonably well constructed, while other streets are metalled roads. From Dilli eastwards the road is metalled with coral limestone and has an average width of from 10 to 14 feet (3 to 4 m.). It would be classed as B2 and crosses several river courses before reaching Hera Saddle. Leaving Dilli, the road goes slightly to the South of East for about 3 miles (5 km.), then climbs up a long low range to the northeast and touches the coast proper at Hera. Road is completely broken by landslides between Dilli and Hera at the saddle (just east of river crossing, $2\frac{1}{2}$ miles (3 km.) east of Dilli). This road has been repaired by the Japanese, blown by our troops twice, but finally repaired by the Japanese. From Hera to Manatuto the road lies only a short distance behind the beach for the whole of its length. There are many small creek crossings which would present difficulty immediately after rain, but it is unlikely the delay would be for more than an hour or so, as the watershed of these creeks is only small. In the main the road is flat and there are no important hills or steep grades until Subao, where the road is winding and from 10 to 12 feet wide for $2\frac{1}{2}$ to 3 miles (3 to 5 km.). Near Meti Naro, about 6 miles ($9\frac{1}{2}$ km.) east of Dilli, the road could be blocked by explosives for a time, because there is a large cutting similar to that at Tibar Headland on the South and the sea falling away on the North. There are patches of fair air cover throughout its length. About 1 mile ($1\frac{1}{2}$ km.) before Manatuto is reached the road crosses the North Lacro River. After wet weather this crossing might cause delay of from one to three days, as it has a large watershed and is the drainage system of a big tract of country.

MANATUTO TO VEMASSE:

Approximately 15 miles (24 km.). This section of country is flat; the road is capable of two streams of heavy traffic (A1). There is scattered air cover

along the road, and, except for the river crossing at Laleia, there are no important streams. The Vemassee River might delay traffic for a day, while the Laleia might hold traffic up for as much as two days. Material exists for construction of rafts for ferry purposes.

VEMASSE TO BAUCAU:

For the first 6 miles (9½ km.) this road is flat and then climbs 4 miles (6½ km.). The end of this stretch continues along a flat plateau for about another 10 miles (16 km.); throughout its length it is wide and capable of taking heavy traffic (A1). There is only one river crossing, about 4 miles (6½ km.) east of Vemassee, which might present difficulties. There is fair air cover along this road, particularly towards Baucau. Throughout its length the road is only from 1 to 5 miles (1½ to 8 km.) inland from the coast. There is no water over considerable stretches of this section.

2a. Road Dilli to Lahane to Lau-Lora:

From Dilli a B1 road runs to the Governor's palace at Lahane and continues as a B2 road to the posto of Lau-Lora. The road winds steeply from the Dilli coastal plain into the hills of Lahane and Lau-Lora. During the wet season the road from Lau-Lora to Lahane becomes a torrent and is unserviceable for M.T.

2b. Road Manatuto to Cribas to Pualaca:

Distance approximately 22 miles (35 km.). Time—11 hours.

From Manatuto to Cribas the road is B2 and capable of carrying traffic only in the dry season. It runs along river beds and climbs several ridges. Cover is fair. From Cribas the road continues south to within 2½ miles (4 km.) from Pualaca, where it degenerates into a good constructed pony track. Country has open timber and is steep in parts. East from Cribas for approximately 4 miles (6½ km.) is a made road towards Lacluta. This is a B2 road with fair cover.

Road 3—Baucau to Com:

BAUCAU TO LAUTEM:

Distance 35 miles (56 km.) approximately. After leaving Baucau the road drops to a crossing of a shallow creek. It climbs up a low ridge and crosses two further creeks and ridges before coming to the Seical River. The Seical River has a moderately large watershed and could delay traffic for from 1 to 2 days during the wet season. From Seical to Laga the road crosses three small rivers, which might delay traffic for from 6 to 8 hours in the wet season, and from Laga to Lautem the general course of the road is flat and capable of taking heavy traffic at all seasons of the year. There is patchy air cover along the road, but it is always good at the creek and river crossings. The steepest grades in this section of the road are about 1-25 on both sides of the Seical River. In general the road from Baucau to Lautem runs through flats which extend from the shore inland beyond the road for 1 mile (1½ km.) until a mass of small hillocks 50 to 250 feet (15 m. to 75 m.) high are reached. These then merge into mountains 3,000 feet (900 m.) in height.

LAUTEM TO COM:

Distance approximately 16 miles (26 km.). This is capable of two streams of heavy traffic in all weathers. It is flat and not far inland (at the most ½ mile; 1 km.). There are a few creeks and patches of good air cover. About 2 to 3 miles (3 to 5 km.) from Com this road may become difficult in wet weather.

3a. Road Baucau to Laga Turnoff to Calicai (Boa Vista):

Approximately 11 miles (18 km.) from Baucau a branch off from the main road runs south for approximately 8 miles (13 km.) to the Posto of Calicai. The road runs up the fertile rice valley of the Mau-Fui River to the foothills at Calicai Palms and lightly grassed areas give little cover from the air.

3b. Road Laga to Baguia:

This is a second class road in fair condition and capable, with a little improving, of carrying M.T. in all weather. The distance is about 25 miles (40 km.) across very rugged country. There are three bridges, but they would not make an effective road block as they are very small. For the first 15 miles (24 km.) the road follows the valley of the Laga River. The country here is heavily timbered and the undergrowth fairly dense, but the remainder of the road over smaller hills is surrounded with sparsely timbered country. There is much rice grown along the route, particularly at the big village of Camalete, 8 miles (13 km.) from Baguia.

3c. Road Luro to Bui Amau (on North Coast):

There is a road suitable for M.T. in dry weather. The steepest patch of this road is about 1-20. Its last three miles to Bui Amau on the north coast between Lavai Cape and Lautem is flat. Throughout its entire length there are patches of good air cover, but in the main the country traversed is forest, interspersed with grassland. Along the ridge crest the ground is open and exposed.

Road 4—Lautem to Fuiloro (Vila de Avis):

Distance approximately 18 miles (29 km.). From Lautem the road goes southeast mainly along a low ridge crest. There are patches of good air cover and only one or two small creek crossings. The road is trafficable at all seasons of the year. Its average width is about 16 feet (5 m.). It is metalled with coral limestone.

FUILORO (VILA DE AVIS) TO TUTUALA:

Distance approximately 21 miles (34 km.). This road traverses the northern portion of the Lautem Plateau. It is traversible by M.T. in all weather. Throughout the first 10 to 12 miles (16 to 19 km.) of its length there is no air cover and the ground is level and exposed. From here on the ground is level, but there are scattered clumps of trees which provide some protection against air observation. Tutuala is the terminal point of this road.

4a. Road Fuiloro to Loré to Saenamo (Dai-Name):

The road from Fuiloro the new Japanese air base, to the port of Dai-Name was a second-class road nearing completion. The Japanese have now made the road fit for M.T. The total distance from Fuiloro to Dai-Name and Vei-Laivai (Silvicola) is about 23 miles (37 km.). From the posto at Fuiloro the road is well formed and graded for 5 miles (8 km.) to Los Pala (Los Palos). This portion of the road runs across a perfectly flat grass plain with little air cover, and is all weather M.T. From Los Pala the road runs over the comparatively flat plateau for approximately 6 miles (9½ km.). In most cases the road is raised above the surrounding country by the expedient of building two parallel walls of coral rock, then filling with packed earth till the road is level. Along this section there are three well-built culverts. After leaving the plateau the country becomes hilly. There is here a break in the new road for about 4 miles (6½ km.), where the track goes over the old road which is in poor condition. The hills are fairly well timbered and covered with creeping vines, affording good cover from the air. The new road commences again and continues through good cover on an easy downward grade across the Chino River to within ¼ mile (400 m.) of Loré, which is on the coastal plain. One quarter mile (400 m.) from Loré the road ends though many sections are almost complete, but there are many spaces where the coral is proving a tough obstacle. The whole surface of the country surrounding the road is coral, covered with thin layers of earth. Coral has been utilised for culverts, banking, surfacing, etc. Although the drains are totally inadequate to carry away the siltage of the rains, the embankments and cuttings are not sufficiently steep for landslides to cause much damage.

From Loré the road runs west for about 2 miles (3 km.), then finishes, though the bush is cleared and the coral is broken ready for the job ahead. Progress along this part is along the old road, which, though fair, is just cleared sufficiently to allow a wheeled vehicle to pass. At Vei-Laivai there is a good road to Dai-Name. The usual tropical growth along the coastal plain gives good cover from the air.

When finished, the road would provide a good surface for all types of M.T. and A.F.V.'s in dry weather, but there are many patches of clay which would be devilishly slippery and boggy during and after rain.

Road 5—Baucau to Venilale:

Distance 16 miles (26 km.). Suitable for M.T. in all weather. This constructed road is B1 (two streams, occasional passing, heavy traffic). Mainly flat, no steep grades. There is poor air cover in places; the surrounding country is open forest and cultivation and grassland. Approaching Venilale the air cover is better. The road itself traverses the eastern end of the Salazar Plateau.

VENILALE TO VIQUEQUE:

Leaving Venilale southward the motor road goes down a grade of about 1 in 10 for approximately 2 miles (3 km.), where it crosses a branch of the Vei Oli River across a bridge 650 yards (600 m.) long, wooden decking on stone arches. The bridge was partially destroyed by Australian forces. The river bed is rocky. Should be possible to construct a ford with long ramps down the banks. It has, however, caused serious interruption to Japanese traffic. Present position uncertain, but as piers, etc., were not destroyed, it probably could be repaired fairly easily.

From here the road climbs up at a grade of about 1-20 to a timbered saddle with good overhead canopy. This saddle between the mountain peaks of Mundo Perdido and Lari Gutu (Laretame) immediately north of the Ossu Posto is one of the most important tactical positions along the road. The crest of the ridge (grass covered) is passed about 2 miles (3 km.) south of the river crossing, where the road drops down at an easy grade of about 1-20 for the next 8 or 10 miles (13 or 16 km.). This stretch of road is through thick forest and some open grass country with complete protection against air observation. There is a bridge 1 mile (1½ km.) north of Loi Una. If demolished, traffic unable to

cross. River bed has many boulders. Second bridge at Raimundo Meira, 3 miles (5 km.) north of Viqueque, on Cuac River. This was demolished. Passable in dry weather, but not for long periods in wet weather. After crossing the Cuac River the road follows down the valley of this stream and is fairly level. Apart from 8 bridges, road is capable of taking M.T. at all seasons of the year. Air reconnaissance late in January, 1943, showed this road to be in constant use.

VIQUEQUE TO BEASSO (BEAÇO):

Distance approximately 10 miles (16 km.). Reliable reports in June, 1942, state that the road was 5 yards (5 m.) wide with good grades and no sharp turns, and that it would carry reasonable motor traffic in dry season, but would cut up under traffic during wet weather. Latest reports (September, 1942) state the road was overgrown with many washaways and capable of motor traffic for 5 miles (8 km.) from Viqueque only—thereafter classed as pony track. They also stated that relatively little work would repair the road sufficiently for M.T. It seems reasonable to assume that it is being used by Japanese traffic. For about 5 miles (8 km.) from Viqueque the country on either side of the road is slightly hilly, then opens out to plains covered with tall grass interspersed with palms. Threequarters of a mile (1 km.) from the anchorage a belt of timber runs parallel with the sea. On either side of the pony track the ground is cultivated and swampy.

Bridges and Culverts: The only major bridge is across the Cuac River 1,100 yards (1 km.) south from Viqueque. It has stone and concrete piers with 12 inch bearers 9 inches apart and wooden decking. Bearers and decking in June, 1942, were in bad order. Recent air reconnaissance shows this bridge to be intact. (January, 1943).

There are several wooden culverts, some being in bad order in June, 1942. Bypasses are available during dry weather.

Fords: Two main fords. Across Biularan Creek there is good ford with sand and rock bottom. A bridge here was washed away previously. After floods the banks are likely to be washed out and need repairs.

Vei-Tum Creek is also forded. There are steep banks with approaches through sand on either side. Bottom probably sandy.

Both fords would delay traffic for up to 36 hours after heavy rain. There does not appear to be much chance of serious landslides.

5a. Road Viqueque to Luca:

Distance 10 miles (16 km.). This section of road is only passable for M.T. in the dry season; in the wet weather it is impassable, but probably would be suitable for M.T. all the year round if bridged. From Viqueque westwards for about 8 miles (13 km.) there is scattered air cover; beyond this 8 mile (13 km.) point air cover is good, the road passing through an area of thick forest. There are no steep grades reported.

Road 6—Beasso to Elomar:

This stretch of road is the militarily important road on the south coast. Nowhere is it more than 2 miles (3 km.) from the sea (at Aliambata), but for the main portion of its distance it lies just off the coast. From Beasso to Aliambata it is trafficable to M.T. only in dry weather. Throughout its length here it passes through thick coastal forest growth with good overhead canopy and some open grass and cultivated fields. There are many small creeks and streams to be crossed, which, in the wet season, would cause delays of from one to three hours.

From Aliambata east the road follows along the shore line veering to and from the shore in several places. The road throughout is very patchy. For short distances it is formed and in good order; then very abruptly it changes to a rough Timor track. Parts are heavily grassed and several dry river beds cross it, making many rocky breaks of 50 yards (45 m.). Small, old and rotten wooden bridges and culverts make the road unfit for M.T. without repair work. The country is heavily timbered. The road would take a lot of putting in good order.

3. Tracks (Numbered 20 upwards on Map No. 1):

Track 20—Tilomar to Bobonaro:

TILOMAR TO MAUCATAR TO

LOLOTOI (18 to 22 miles; 29 to 35 km.):

Eight hours to Maucatar, eight hours to Lolotoi. Main track not as shown on map, but follows river bed with hard climb up to Maucatar. Lolotoi is visible from this point. Then steep descent to Riato River, steep climb over ridge and descent to second river. Patches of good air cover, but mainly open.

LOLOTOI TO MAPE:

Walking 10 to 12 hours, horse 8 to 10 hours. Track first travels northeast down grassy slopes. Then a long cutting with little cover from air or ground

observation. After turnoff from Lebos track it turns east, crossing some creeks, then follows a mountain ridge with little air cover; then crosses river where the track to Mape turns south from the Bobonaro track. Fair air cover along most of route.

MAPE TO BOBONARO:

Distance 9 to 10 miles ($14\frac{1}{2}$ to 16 km.), 5 hours walking, 4 hours horse. Little air cover for first mile ($1\frac{1}{2}$ km.), down grassy mountain side. Crosses a small creek bed usually dry, then crosses steep ridge with creek with permanent water on other side. Then climbs steeply on to a ridge with native village and heavy timber growth. Track then goes into more open country with precipitous descent into larger creek bed 30 feet (9 m.) wide with vertical walls 15 feet (5 m.) deep and a small flow of permanent water.

Two more creeks are crossed with a climb of from 1,000 to 1,500 feet (300 to 450 m.) between. Then a steep ascent with the track winding with numerous hairpin curves. As the top is reached the country opens with little air cover, and a telephone line is followed into Bobonaro.

20a. Central Portion of Track Lolotoi to Lebos:

Four hours. Track is fairly level with some open country suitable for paratroops. It passes through a native village. No creek crossings.

Track 21—Tilomar to Suai to Debos, Lebos to Bobonaro:

TILOMAR TO DEBOS TO SUAI (Tilomar to Debos 6 hours)
(Debos to Suai 1 hour)

From Tilomar, which is situated on a hill approximately 600 feet (180 m.) high, the coast is visible from the entrance of Benain River in Dutch Timor to Suai. Villages of Debos, Cumnassa, Maucatar, Dacula and Forem (Foho-Rem) are also visible.

Track crosses fairly open rolling country. Quick descent to river which is no obstacle except in wet season. Then more thickly timbered country to Debos. Several creek crossings and many boggy patches. Otherwise not much obstacle to M.T. from Tafara River to Debos. From Debos to Suai, flat country with many maize fields and track could easily be improved to take M.T.

DEBOS TO MAUCATAR (4-5 hours):

Horse track only. General upward grades, reasonable going. Air cover over central portions.

**MAUCATAR TO LEBOS TO
BOBONARO (13 hours):**

Track follows long spur with mainly open country and patchy air cover. Then crosses several ridges before Lebos. From Lebos onwards the going is heavy with many ridges and gullies to be crossed. Air cover patchy, with very open country both sides of Lebos. The last 6 miles ($9\frac{1}{2}$ km.) to Bobonaro is difficult with three bad rivers liable to flood, and high ridges between.

21a. Track Lebos to Baoekama River:

Suitable for pack horses. Leaves Lebos through open country and follows ridges west. Then descends through steep timbered country for four hours. Cross Dutch Border and then cross river 3 miles (5 km.) west of Abis, then climb steep ridge in open country. Country still open to river at Deboelolik. Then open country to Maoedemoui, a native village. Then descends steeply to Baoekama River. The river bed is 200 yards (180 m.) wide with several narrow water channels. Can be followed downstream to junction of Tarlae River.

21b. Track Lebos to Pubeles to Maliana:

Distance 14 miles ($22\frac{1}{2}$ km.), time taken 8 hours. This track leaves the Lebos-Bobonaro track at the position marked as Pubeles on the map. It is an extremely exacting and difficult track from Pubeles to Maliana even for ponies. The jumbled mountain ranges rise to 5,000 feet (1,500 m.) and the track, which is badly graded, does likewise. There are few good patches of cover.

Track 22—Tilomar to Fatu-Lulic to Lebos:

TILOMAR TO FOREM (4 to 5 hours):

Rough mountain country with one main river crossing.

FOREM TO FATU-LULIC (6 to 8 hours):

Rough mountainous country with several difficult patches. Well timbered.

FATU-LULIC TO LEBOS (4 to 5 hours):

Less rugged, but long descents and climbs across river valleys. A considerable amount of open country.

22a. Track Tilomar to Dacula to Foho-Rem:

Three to four hours to Dacula. Three hours Dacula to Foho-Rem.

Mainly steady climbing across rolling open country. Dacula has good observation of coast to south and west.

Then rougher going over more forested country to Foho-Rem.

22b. *Track Foho-Rem to Oliveira to Sabi:*

Forem to Oliveira approximately 2 to 3 hours.

Track not well defined and crosses rough mountain country, well timbered.

From Oliveira to Sabi there are many long grades.

Demolition of track in places would cause long delays.

Good air cover and O.P's.

22c. *Alternate Track Maucatar to Foho-Rem:*

Leave Tilomar to Maucatar track at Mau-Fui River and follow northern stream for 2 miles (3 km.). Then cross and climb very steep track to Foho-Rem.

Track 23—Bobonaro to Maliana to Cailaco to Marobo:

BOBOARO TO MALIANA:

Distance 12 to 13 miles (19 to 21 km.), $4\frac{1}{2}$ to $5\frac{1}{2}$ hours' walking.

This track is again typical of most Timor tracks and unsuitable except for pack animal or on foot.

Climbing to the ridge on the west of Bobonaro the track follows the tip of the ridge for approximately 2 to 3 miles (3 to 5 km.). This ridge is windswept, devoid of trees, and in wet weather muddy and clayey. From this ridge it is possible to view the sea on the north and south coasts. Descending the northern side of the mountain ridge the track is precipitous in parts and enters a mountain pass before crossing Lone Tree Saddle from which the Nunura Plains can be seen. Several small creeks are crossed as the track winds through many re-entrants. About $1\frac{1}{2}$ hours from Maliana the track passes below a native village set on the top of a spur and moves out into open country with little cover from air and general observation. The track is still descending and moves over low foothills to the Nunura Plains and the posto of Maliana, which is situated on the southeastern corner of the plains on the banks of the Bulobo River.

CAILACO TO MAROBO:

Time taken, 6 hours.

Distance 8 miles (13 km.). This difficult track crosses the huge Cailaco Range. Climbing to the saddle between Mt. Hatu Mati (Lulic) and Mt. Cailaco, the track winds to the saddle. It then winds steeply around many re-entrants and is subject to many landslides, on the eastern side of the range. The track then crosses the sulphur source and thence leads in to Marobo. The slopes of Mt. Cailaco are covered with coffee plantations and tropical undergrowth and air cover from the air is excellent.

MALIANA TO CAILACO:

Distance 9 miles ($14\frac{1}{2}$ km.). Time taken 5 hours. The track winds north over the southeast portion of the Nunura Plains past an excellent position for an airdrome and runs parallel with the Bulobo River for 2 miles (3 km.). It then winds round the northwest slopes of Mt. Cailaco and Mt. Hatu Mati and crosses many re-entrants. After passing a sulphur stream in a tropical grove, the track rises to Cailaco. Cover from the air is good and the going is easy for ponies.

23a. *Track Maliana to Marobo:*

Time for the journey, 6 hours. Distance, 9 miles ($14\frac{1}{2}$ km.). For the first 3 miles (5 km.) the track follows the Maliana to Bobonaro track to Lone Tree Saddle. It then descends, crosses the headwaters of the Marobo River and climbs steeply to the village of Rita-Bau at the foot of Mt. Cailaco. The exhausting track crosses two more tributaries of the Marobo River before reaching Marobo. Good cover from the air between Lone Tree Saddle and Marobo, but little cover approaching Maliana. From Lone Tree Saddle the track is difficult even for ponies.

23b. *Track Cailaco to Hatu-Lia:*

Distance, 8 miles (13 km.). Time, 4 hours. The track heads in a north-east direction down the steep spurs of the Marobo River and passes through coconut plantations. The track between the Marobo and Garrai Rivers is swampy, passing through rice fields. After crossing the Garrai River, the track climbs steeply and crosses the road twice before heading direct for Hatu-Lia. Cover from the second road crossing to Hatu-Lia is excellent, being afforded by extensive rubber plantations. The track is a difficult one because at each end it is very steep and subject to washaways, while the central portion is very slushy.

23c. *Track Purema to Maliana:*

Distance, 9 miles ($12\frac{1}{2}$ km.). Time, 3 hours. From the mission of Purema on the saddle between Mts. Cailaco and Hatu Mati a track descends the western side of the Cailaco Range, and after a very steep and tortuous descent, hard even for ponies, it joins the Maliana to Cailaco track at the Bulobo River. Cover is fair.

23d. *Track Cailaco to Atsabe, Marobo to Atsabe:*

There are several native tracks between Cailaco and Atsabe and Marobo and Atsabe. All are very difficult to cross as they pass through the large Atsabe rice fields. All portions of the tracks join the old roads and then depart from them cross-country again. There is practically no cover from the air.

Track 24—Maubara to Atabai to Balibo:

MAUBARA TO ATABAI:

Distance, 12 miles (19 km.). Time taken, 7 hours.

The track heads south up the well clad ridges and climbs through the Portuguese plantations at Lau-Vai and Bela Vista to the crest of the range near Mt. Guguleu. It then descends straight down a spur to Talo Menaro, a Portuguese dwelling on the north bank of the Lauela River. Crossing this river, it runs up the course of the Be-Bai River for one mile and joins the Atabai to Cailaco track near the river crossing. The track is good except during the wet season, when it is very difficult and dangerous to cross the big rivers. Cover is good along the track.

ATABAI TO BALIBO:

Distance, 16 miles (26 km.). Time taken, 10 hours.

Track descends for 3 miles (5 km.) from the eastern rim of the Balibo Plateau to the large village of Fatu Laran. Cover until here is good, but the track then descends and stretches for 5 miles (8 km.) across a plain. The central portion of the Balibo Plateau is really a continuation of the Nunura Plains. The country is very open until the spurs leading to Mts. Samono and Samirim are reached. The track continues up and down over low hills until the large and dominating posto of Balibo is reached. The track is an easy one for ponies.

24a. *Track Atabai to Tailaco to Batugade:*

Distance, 28 miles (45 km.). Time taken, 16 hours.

The track descends to the northwest from Atabai, down several ridges and watercourses, until the village of Tailaco (marked Atabai on the Asia Investment map) on the south bank of the Lois River is reached. There is good cover from the air, but the track is very difficult. From Tailaco a well made ancient track runs south, then southwest along the coast. It runs through several fishing and salt-making villages and skirts the northwest rim of the Balibo Plateau for the entire distance. There is little cover from the air. Except for the mosquitoes, the going is excellent. Track vehicles would have no difficulty in passing along the coastal track and with little labor M.T. could be used.

24b. *Track Tailaco to Maubara:*

Distance, 12 miles (19 km.). Time taken, 6 hours.

After crossing the mouth of the malaria-infested Lois River (impossible in wet weather), the track heads north along the coast until it climbs up the ridges towards Mt. Fatu Beru.

It then passes through several villages, near the sea coast, until Morai is reached. From Morai to Maubara is an old road which could be used by M.T. in the dry weather. The track is a good one for ponies, but there is little cover from the air.

24c. *Hatu-Lia to Fatu-Bessi to Boibau to Liquissa (Liquiça):*

Distance, 20 miles (32 km.). Time taken, 13 hours.

The track heads northwest from Hatu-Lia and crosses the Batuto River and the Lalimilau Range at its western end. It then swings east into the Sociedade's coffee plantations at Fatu-Bessi. The track then heads north and then crosses the Lauela River and passes through the large native market centers of Boibau and Banturo. The track then climbs north past Mt. Cutu-Lau (Fatu Masin on map) and descends a spur towards a watercourse which leads to Liquissa. Cover throughout the journey is good, but portions of the track are very steep.

24d. *Track Cailaco to Atabai:*

Distance, 12 miles (19 km.). Time taken, 8 hours.

From Cailaco the track winds down round the re-entrants of several spurs until the plain is reached. It then wanders through 15 feet (5 m.) high grass and palms until it meets a tributary of the Be-Bai River. The bed is followed across the plains and crosses the ill-defined Hatu-Lia-Nunura road. Movement is very difficult across the Nunura Plains because of the dense growth. It is impossible to cross the Be-Bai River in the wet season, but it can be forded in the dry season, although care must always be taken because of crocodiles. After crossing the river the track winds up round re-entrants and through several villages until the old posto of Atabai is reached, situated on a saddle between two hills. For several months our troops used Atabai as an O.P. for shipping passing the mouth of the Lois River. Cover throughout the journey is excellent, but the track is a difficult one even for ponies.

24e. *Track Atabai to Hatu-Lia:*

Distance, 11 miles (16 km.). Time taken, 5 hours.

This track leaves the junction of the Atabai to Maubara and Atabai to Cailaco track at the Be-Bai River crossing. It then crosses the low swampy ground between the Be-Bai and Marobo Rivers and runs up the right bank of the Marobo River until it reaches the road crossing at the Portuguese house of Tata. From here it crosses the rice fields in a northeasterly direction until it strikes the main road $\frac{3}{4}$ mile (1 km.) west from Hatu-Lia. Cover along the track is poor and the going is extremely difficult because of the swampy nature of the ground.

24f. *Track Boibau to Talomenara:*

Distance, 8 miles (13 km.). Time, 3 hours.

The track runs along the right bank of the Lauela River. Generally it sticks to the river flats and river bed, but at times it crawls over the tributaries of the Lauela River and the spurs of the northern mountains. Cover is poor.

Track 25—Beco to Mape to Ainaro:

BECO TO MAPE:

Distance, 12 miles (19 km.). Time, walking 4 to 5 hours, horse 4 hours.

For the first mile the track is well defined, about 8 to 10 feet ($2\frac{1}{2}$ to 3 m.) wide, and leads through banana and maize plantations. The track winds through flat grasslands, with grass 8 to 10 feet ($2\frac{1}{2}$ to 3 m.) high. Reaching the Lono-Mea River, which is about 350 yards (320 m.) wide, mostly dry and covered with small rocks and boulders, and with only a small channel of water running, the track leads up the river for approximately one mile ($1\frac{1}{2}$ km.), crossing and recrossing at intervals. Reaching the river flats, the track continues on through cultivated rice fields for approximately one mile ($1\frac{1}{2}$ km.), and again the river bed is crossed to higher ground, whence the track gradually leads upward to low foothills and thence the climb is steadily steeper, leading to a high ridge where a small native village is passed on the left. Proceeding along this ridge, the apex is crossed and the descent is steep and abrupt with a winding hairpin track in bad condition and covered with numerous boulders and rock outcrops. The river crossing is similar to most of the rivers, having seasonal characteristics. The rise on the other side is at first abrupt, leading through hairpin turns and re-entrants, and gradually easing in sharpness of ascent. The track varies in width and is rough and is in bad condition and is useless except for men on foot or on pony. The last mile ($1\frac{1}{2}$ km.) of the track is steep and rugged and leads gradually up to the posto, which is situated on the apex of a large mountain spur. It would be impossible for any mechanised vehicle to move along these mountain paths or tracks.

MAPE TO AINARO:

Seven to eight hours; foot or pony. Unmade track. Descends for 2 miles (3 km.) into river. Crosses small ridge to second stream. Follow down for 1 mile ($1\frac{1}{2}$ km.), climb high ridge and cross another river. Follow well defined track, with good air cover, sidling round ridges past where Arcos is shown on map. Arcos is really Cassa which overlooks terrace between two streams south of Ainaro. This is flat, 1 mile ($1\frac{1}{2}$ km.) wide and several miles long with vertical fall into streams. Could be used as E.L.G. if grass cleared. Track then crosses ridges and two streams north into Ainaro, the last $2\frac{1}{2}$ miles (4 km.) being flat going.

25a. *Track Beco to Lolotoi (7 to 8 hours):*

Zigzags up ridge and then follows southern side of spur for 8 to 10 miles (13 to 16 km.). Fair air cover, particularly towards southern end.

Location of this track is doubtful. It may run up Olan River.

Track 26—Suai to Beco to Hatu-Udo to Betano:

SUAI TO BECO:

Walking 5 hours; horse 4 hours.

A typical native track leads from the coast through a man-made grove of trees, covered with thick tropic growth and inhabited by small monkeys. It is approximately 6 to 8 feet wide and continues for about $\frac{1}{4}$ mile (400 m.), opening on to a series of small wooden platform bridges—spanning the swamp and leading to the native village of Suai. These bridges are made of small, rough timber covered with earth, and are generally in a rotting condition. They could easily be repaired for M.T. Turning sharply north through the village, the track leads over a similar small platform foot bridge spanning the upper region of the swamp. Thence it widens out, to about 15 feet (5 m.) in width and is a straight road for approximately 2 miles (3 km.), leading to the native village of Cumnassa—boarded on each side by cultivated fields, this track would be suitable for M.T., although in wet weather the going would be heavy as the ground is soft and without much foundation. Turning east at Cumnassa, the track narrows down again to about 8 to 10 feet ($2\frac{1}{2}$ to 3 m.)—

well defined—leading through flat country, heavily bordered on either side by tropical growth and tall palm trees.

Reaching the Carau Ulo River, the crossing is comparatively easy in the dry season, when the river narrows down to a small channel, about 20 feet (6 m.) wide. The bed of the river is stony and hard, with numerous large boulders and debris washed down from the upper region of the river. Leaving the river the track leads through typical tropical growth with the track narrowing down to about 6 feet (2 m.) in width. On each side the growth is thick and interspersed with tall palm and coconut trees. Reaching the Riato River, the bed is hard and sandy and covered with small rock and gravel. No difficulty would normally be experienced in crossing this river, although, typical of all these coastal rivers, heavy rain in the mountains can turn the almost dry river beds into raging torrents, which will retard the traveller for some hours.

The track then leads on through similar country, except that large bamboo clumps are met with on each side of the track. Half way to the Olan River the track enters a small creek bed, about 150 yards (140 m.) long and 10 feet (3 m.) wide. It continues along this creek, after which the track is picked up again and leads to the third river, which, like the other, is mostly dry and of approximately the same width.

After leaving the river, a wooden platform bridge is crossed, spanning a small, but deep creek bed, about 10 to 15 feet (3 to 4½ m.) deep and 20 feet (6 m.) wide. The bridge is of rough construction, built of small logs and measures approximately 10 feet (3 m.) wide and 25 feet (7½ m.) long.

Approaching within 3 miles (5 km.) of Beco, the track leads through tall grass 8 to 10 feet (2½ to 3 m.) high. The country is open with little cover; a field of rice is passed on the south side of the track, extending for 1 mile (1½ km.). In the rainy season, this part becomes covered with thick mud and slime, and movement is very slow. Within a ¼ mile (400 m.) of Beco, the track improves and widens out to a well defined 10 feet (3 m.) road. This continues through and beyond the small village of Beco for approximately ½ mile (1 km.).

The telephone line from Suai to Beco follows this track practically all the way and is a useful guide.

It is considered that, with minor engineer construction, M.T. and, particularly, tracked vehicles could negotiate this track from Suai to Beco and to ½ mile (1 km.) beyond Beco, to the Lono-Mea River on the track to Mape.

Track 26—Beco to Rai-Mean:

This track is subject to tidal rivers which would cause delay to all classes of traffic. Rai-Mean is approximately 2 hours' journey north from the beach and the track passes through thickly timbered country; swampy in wet weather. It is situated on the flat coastal belt between the mountains and the sea which varies in depth approximately 5 to 12 miles (8 to 19 km.).

BECO TO HATU-UDO (NOVA LUCA):

Distance, 15 miles (24 km.); time taken, 9 hours.

This track leaves the Beco-Mape track at the Mor River approximately 5 miles (8 km.) from the coast, and winds up and down across spurs and water-courses until it reaches Lias (marked Cassa on map) on the Be-Lulic River. The track then climbs from the river to the posto at Hatu-Udo. Air cover along the track is fair and there are many thick clumps of nipa palm and bamboo. The track is good for pony transport, although the Mor and Be-Lulic Rivers are very difficult to cross during the rainy season.

HATU-UDO TO BETANO (COASTAL TRACK):

From Hatu-Udo it passes through 4 to 5 miles (6½ to 8 km.) of thick forest with good overhead canopy. Then through nipa palm and elephant grass country, still with good air cover. The only river crossing is the Sue River, about 4 miles (6½ km.) west of Betano. The river is approximately 500 yards (450 m.) wide at the crossing, and, being one of the most powerful rivers on the island, forms a complete barrier during the wet season.

26a. Track Lias to Cassa:

Distance, 12 miles (19 km.). Time taken, 6 hours.

This track follows the Hatu-Udo-Beco track until Lias at the Be-Lulic River is reached. It then runs northwest up the right bank of the Bui-Nuruc River until Cassa is reached by climbing a steep range. The track then follows the Mape-Ainaro track to Ainaro. Cover is fair throughout the journey.

Track 27—Betano to Hatu-Udo to Ainaro to Maubisse (4½ to 5 hours):

Fairly easy going, with fair air cover near the Sue River crossing and near Hatu-Udo. Crossing is wide, with gravel bottom, but same applies to this crossing as to the one above.

HATU-UDO TO AINARO:

This is a wide track in places (12 feet: 3½ m.) with other sections much narrower (4 feet: 1¼ m.). First follows a ridge crest falling gently to North.

At two miles (3 km.) out of Hatu-Udo the country flattens out for one further mile to the Be-Lulic River.

River can be crossed in dry season, but after heavy rain it may obstruct traffic for up to two days. Track then rises (grade 1-10) for $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) to large village of Sucu-Rai, and then follows contour along west slopes of Suro Range. Half a mile from Ainaro the track descends steeply to cross tributary of Be-Lulic River. Similar crossing place. Then rises gently to Ainaro, where three tracks branch out. Patches of air cover, but mainly open country throughout.

AINARO TO AITUTO TO MAUBISSE:

Distance, 17 miles (27 km.). Time taken, $8\frac{1}{2}$ hours.

This track, along which many actions have taken place, is really an old road too much in disrepair to be claimed as a road. It crosses some of the most rugged country on the island. There is very little cover throughout the route. From the thickly populated mission center of Ainaro the track winds up to the saddle of the Suro Range from which the Maubisse Valley can be seen. The track then winds steeply down and crosses a rapid tributary of the Be-Lulic River. With the huge mountain spurs of the Ramelau Range to the northwest, and of the Cablac Range to the southeast, the track winds precipitously along the right side of the Be-Lulic gorge, crossing many streams until Aituto at the junction of the Maubisse-Ainaro and Maubisse-Same tracks are reached.

From Aituto the track winds round a big range up to the Maubisse Saddle and then descends steeply across the Carau-Ulo River into the posto of Maubisse. Because of its nature this track from Ainaro to Maubisse has been the scene of some of our most successful Australian ambushes of the Timor campaign.

27a. Track Hatu-Udo to Sumulo:

Distance, 12 miles (19 km.); time taken, $6\frac{1}{2}$ hours.

For $\frac{1}{2}$ mile the track follows the ridge along the Hatu-Udo-Betano track. It then turns sharply to the northeast and passes along gum tree clad ridges similar to Australian hills. After crossing the Ai-Asso River the track stretches along a flat into a large coconut plantation, where cover is good. The track then winds up to the junction with the Same-Betano track, where the village of Sumulo used to stand before the Japanese burnt it.

27b. Track Be-Lulic River Crossing to Raimera to Same:

Distance, 9 miles ($14\frac{1}{2}$ km.). Time taken, 6 hours.

This very difficult track has a good tactical value, as it can be used to bypass the main tracks. Cover is excellent along the route, which starts from a large coconut plantation at the Be-Lulic River. The track winds up and down over rugged country, crosses the Ai-Asso River and several other mountain streams, and passes near to the Portuguese coffee and pineapple plantation at Raimera. It then descends along an old road past the church and mission and rubber plantation to the Same posto.

Track 28—Betano to Same to Maubisse:

BETANO TO SAME:

Distance, 15 miles (24 km.). Time taken, 6 hours.

This track, unlike the majority in Timor, passes over relatively flat country. From the coast to the Sue River the country is swampy in the wet season, but in the dry would carry jeeps and tracked vehicles. Cotton and banana plantations used to abound at Betano before Japanese warships shelled it in August, 1942. The Sue River crossing presents great difficulty during the wet season. After crossing the river the track crosses low gum tree clad hills until it joins the Hatu-Udo-Same track. From Sumulo the track descends with little cover across two streams and becomes an old road which used to connect Same with Betano. This road continues into Same and with much labor could be made fit for M.T. Tracked vehicles could pass from Betano to Same now. Coconut plantations give adequate cover for the last $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) of the route to Same. There is excellent cover from Betano to the crossing, the growth in places being quite tropical, but from the crossing to Same, cover is more scarce until coconut plantations are reached.

SAME TO MAUBISSE:

Leaving Same and travelling northeast, the river Abaca is crossed by a wooden bridge, just before reaching the main Maubisse-Alas track. At the junction the road swings north on flat country for a distance of two miles (3 km.). Here a well constructed village is passed on the western side of the road. To this point the road would be passable for jeeps. It then commences to climb the Cablac Range and, as far as the Same Saddle, is an excellent partly-constructed pony track, with good air cover.

West of the track for $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) is a precipitous stretch of the range with large boulders 8 feet to 20 feet ($2\frac{1}{2}$ m. to 6 m.) in diameter, abutting the road. On the northern side of the saddle the country is fairly open and

the track becomes narrow, but still fit for ponies. It then drops down into a tributary of the Be-Lulic River and immediately afterwards climbs for $1\frac{1}{2}$ miles ($2\frac{1}{2}$ km.) to the village of Aituto, at the junction of the old Ainaro-Maubisse road. This road is unsuitable for M.T. because of landslides, but is used by pack ponies without difficulty. There is no air cover whatsoever along this section.

28a. *Track Same to Nunamogue:*

Distance, 12 miles (19 km.). Time taken, 11 hours.

This mountainous track was much used by our troops because of its rugged nature, which makes it suitable for hideouts. The track climbs over many spurs on the southern slopes of the Cablac Range and crosses many torrents. To cross the Cablac Saddle at the western end of the range the track climbs steeply to 6,500 feet (2,000 m.), crosses two crests and descends precipitously across the Be-Lulic River and joins the Ainaro-Maubisse track below Nunamogue. There is excellent cover along this track, but the going is almost too difficult even for ponies. During the wet season the track is very slippery and subject to landslides, while it is impossible to cross the streams after rain.

Track 29—Lete-Foho to Tumela to Maubisse:

Distance, 13 miles (21 km.). Time taken, $6\frac{1}{2}$ hours.

The track follows a spur from the Ramelau Range for the greater part of the distance to Tumela. Fair air cover.

Tumela is the junction of the Hatu-Builico-Maubisse track. From the junction to the brick kiln, which is about half way between Tumela trig. point and Maubisse, and about $\frac{1}{4}$ mile (400 m.) from the saddle, there is a good pony track with fair air cover. From the saddle the track winds down to Maubisse, cover being fair.

29a. *Track Atsabe to Hatu-Builico to Tumela:*

Time taken, 8 hours.

The track, which is approximately 15 miles (24 km.) in length, crosses Ramelau Range, after a long climb at nearly 10,000 feet (3,000 m.). The track to Mt. Tata-Mailau is very steep in places. Good air cover. Once the range has been crossed there is a 6 ft. (2 m.) track, constructed, but very steep in places, for the whole distance down to Hatu-Builico. The track then climbs a gentle slope to Mt. Tumela at the junction of the Lete-Foho-Hatu-Builico (29) and Maubisse-Hatu-Builico (29a.) tracks. This track crosses the greatest mountain barrier on the island. The going is very exhausting for both ponies and porters, but the track is reasonably graded.

29b. *Track Ainaro to Atsabe:*

Distance, 12 miles (19 km.). Time taken, 7 hours.

The track leaves Ainaro in a northwesterly direction and crosses rice fields and river beds with very little cover. Leaving the flats the track climbs tortuously up the Ramelau Range until it joins the Bobonaro-Atsabe road at the saddle. The track is very difficult to climb and cover is poor.

29c. *Track Hatu-Builico to Nunamogue:*

Distance, 6 miles ($9\frac{1}{2}$ km.). Time taken, 2 hours. Time for reverse trip, 6 hours.

The track climbs a saddle to the south of Hatu-Builico and then descends steeply through open rugged country to the strategic village of Nunamogue overlooking the Ainaro-Maubisse track. The track is difficult for ponies.

29d. *Track Atsabe (Nova Ourem) to Lete-Foho (Nova Obidos):*

Distance, 11 miles ($17\frac{1}{2}$ km.). Time taken, 6 hours.

With roads out of commission this is a very important track. An excellently graded track, suitable M.T., though subject to landslides and with little cover from the air, leads down to the Bandeira River. From the river there is a steep climb to Rotai, situated on the rugged saddle between Mts. Daralau and Catrai. Again the track descends with little cover to the Garrai River, after which there is a very steep climb to Lete-Foho. There was a wooden bridge across the Bandeira River. The track is a good one for ponies.

Track 30—Aileu to Remexio:

Distance, 11 miles ($17\frac{1}{2}$ km.). Time taken, 6 hours.

The track heads northeast along the valley of the Saboria River with fair cover from the air. It climbs the Fatu-Isi-Talavera Range and joins the Dilli-Remexio track, after which it winds round several large re-entrants, passes through the extensive banana plantations at Liolissa and climbs to Remexio. Cover is good and the track is a comparatively easy one.

30a. *Track Dilli to Remexio to Lau-Lora:*

Distance, 20 miles (32 km.). Time taken, 12 hours.

Approximately 5 miles (8 km.) east of Dilli, a well graded track leaves the main road and heads to the South across well clad river flats. It then climbs a spur and winds round many re-entrants which afford good cover until

it joins with the Aileu-Remexio track. From here the track goes west along the crest of the Fatu-Isi-Talavera Range. The track is well graded and a good one for ponies. At times the track joins an ancient disused road. North of Fatu-Isi the track heads down suddenly to Lau-Lora, whence Dilli can be well observed. Cover throughout is good.

Track 31—Nova Caminha to Coli-Bahaha:

Time, approximately 6 hours.

Foot track. Follows tributaries of North Lacle River for much of the way. In any but the wet season the wide river bed has only a narrow fordable stream throughout its course. Bed is very rocky. Protection from the air very good, but generally a bad place for ambush. Water very good and plentiful.

Coli-Bahaha is a village of a dozen huts. Sits on the junction of the track from Nova Caminha to Fac Lau and a track east from Aileu. Tactically unsound unless vigilant patrols are maintained. Always exposed to the air.

COLI-BAHAHA TO FAC LAU (CAI-MAUC):

Time, approximately 2 hours.

These two villages are intervisible and at no great distance apart, but the track between them is not the easiest. Soon after leaving Coli-Bahaha the track winds down into the broad, dry river bed, follows it for half a mile, and then begins to climb again. At this point the track makes one of the steepest ascents on the island. A hard hour's climb for even the fittest. Impossible for any transport other than the Timor pony. Fac Lau is on a hill feature much like Coli-Bahaha, but with better all round visibility and protection.

FAC LAU (CAI-MAUC) TO REMEXIO:

Time, approximately 4 hours.

A good, easy-going, generally level track, rather stony and rough in patches, but often wide and smooth. Nearly always protected from one flank by the sides of the hills which it skirts, and not always exposed to view on the open side. This track leads right into Remexio, the last hour being a fairly steep upward climb.

31a. Track Aileu to Coli-Bahaha:

Thirteen miles (21 km.). Time, 6 hours. Track is fairly open and runs along a ridge for the entire journey.

31b. Track Turiscai to Track 31:

The track winds over hilly country, crossing several tributaries of the North Lacle River before joining the track from Nova Caminha.

31c. Track Turiscai to Aileu to Maubisse Road (1j):

Eight miles (13 km.). Time, 4 hours. This track winds in a westerly direction over hilly country. From several points there are good O.P.'s. on Maubisse and Aileu. Very little cover from the air.

Track 32—Alas to Mindelo to Maubisse:

Distance, 24 miles (38½ km.). Time taken, 13 hours.

The track crosses undulating country with one creek for two miles (3 km.), the track passing through bamboo and other air cover. It then crosses flat country dissected by frequent creeks for several miles. Good air cover throughout. It then descends slightly to the Sue River, where the track turns north from that river, running to Same.

It climbs on to ridge crest, which is followed past Mindelo to Mt. Aituma with a branch track connection to Maubere and Turiscai. The track to Maubisse has steep grades across two or three high ranges. It crosses open country and there is no air cover except close to Maubisse.

32a. Track Same to Junction Track 32 to Alas to Maubisse:

Two hours' walking.

A good track goes north from Same, crossing three or four creeks and climbing divides between. At a junction of tracks two miles (3 km.) north of Same, the track swings east, descends to the Carau-Ulo River, climbs the divide on the other side, and drops steeply to another branch of the Sue River, where one track leads north to Mindelo (Maubessi) and the other track continues east to Alas. Both rivers cause delay in the wet season.

Track 33—Betano to Fatu-Cuac to Alas to Turiscai:

Time, approximately 3 hours. Foot trail, suitable only for troops on foot or Timor ponies. At first wide and easy going, but then becomes narrow, winding, ascending and generally well shielded from aerial observation. Does not afford frontal visibility of more than 200 yards (180 m.) at the best of places. Generally, no visibility to flanks. Vegetation mainly bamboo, lawyer-vine, palms and shrubs.

Fatu-Cuac is approximately 1,000 feet (300 m.) above sea level. Like Betano, it is a collection of native huts. Nearest water is fresh creek about

15 minutes' march away. Local cover from view very good. Vegetation coconut palms, some tuaka, broad-leaved eucalypt.

FATU-CUAC TO ALAS:

Time, approximately 8 hours. The track winds over fairly steep country, then follows bed of Quelan River for 3 miles (5 km.).

Ground is level along bank of Quelan River. Track is fairly level until river is crossed, then ascent is steep, usual winding track, numerous hairpin bends leading to the top of the ridge. The track then undulates until a third river crossing is made, whence it again ascends, passing on the western side of the track an old Portuguese house, one time used as a posto, now not in use. The ascent is still upwards and the track approaches Alas from the East, and leads to Chefe de Posto's residence situated on top of the ridge. Excellent O.P. position on this point. In the dry season, area is parched. River and creek beds are dry and rocky. Climate is torrid. Visibility from the air is often very exposed. It is stated that vehicles of the jeep type could use this track for the greater part.

Alas consists of a deserted Portuguese mission, church and residence for the Portuguese Chefe de Posto. Buildings are of white stone on a hill feature dominating the surrounding country. Very exposed, but dense coconut groves and grass-land afford good protection in the neighborhood.

ALAS TO FAI-NIA:

Time, approximately 6 hours.

From Alas onwards the going is arduous for unseasoned troops. The trail is suitable only for foot troops and ponies. At times, the ascent is very steep and rugged, and the track rather exposed to the air. In some places high grass and some trees give some cover from view, but toward Fai-Nia the track begins to enter the belt of rolling, green-grass hills where the only cover from aircraft is on a flank behind the ridges. Water supply good.

FAI-NIA TO TURISCAI:

Time, approximately 4 hours.

Slightly better protection in parts, though track is still in the upland grass country where it follows the ridges and is often exposed on the open sky-line. All-round visibility is excellent. Ambush is possible.

Fewer natives are met on this track as much of the country is apparently of comparatively recent igneous origin and has only a thin surface of soil unsuitable for cultivation.

33a. Track Betano to Port Alas (Besusu) to Alas:

Distance, 15 miles (24 km.). Time taken, 8 hours.

From Betano a good flat track suitable for jeeps and tracked vehicles leads through dense tropical growth across the Quelan River to the bay immediately east of Meti Boot. The track passes the Besusu Plantations, then heads north across the Besusu Plain, climbs a spur, and crosses several tributaries of the South Lacro River before entering Alas. An alternative well-covered track leads from Betano through Fatu-Cuac and then southeast to the Quelan River crossing.

33b. Track Port Alas to Lacro River to Join Track 34:

The track traverses flat plain country, thought to be suitable for airdrome construction. Poor air cover.

Track 34—Alas to Fatu-Berliu (Nova Anadia):

Time, 5 hours for pony.

A good made road in dry seasons, suitable for light M.T. as far as the South Lacro River, approximately 6 miles (9½ km.).

About 2 miles (3 km.) from Alas the road crosses a tributary of the South Lacro River. One and a half miles (2½ km.) further east another tributary is crossed with a wide bed, approximately 800 yards (750 m.) wide. After this tributary is crossed the road then passes through level and undulating country for a distance of 3 miles (5 km.), when it reaches the South Lacro River, and follows its bed north/northeast for about 1 mile (1½ km.) There is fair air cover on the west bank of the river. From the South Lacro it becomes a made track and could be made suitable for jeeps with a fair amount of labor.

The steepest part of the track is for one mile (1½ km.) after leaving the river bed. Distance from the river to Fatu-Berliu about 3 hours' march. Air cover on this portion of the road is fair.

FATU-BERLIU TO SOIBADA:

Time, 5 hours for pony.

This track is narrow, steep and rocky. From Fatu-Berliu to Sahi River is about 4 hours' march, the last 1½ hours to the river being fairly steep. Fair air cover.

From the Sahi River the track rises steeply to Soibada.

SOIBADA TO PUALACA:

Time, 8 hours.

From Soibada to Pualaca, the track is good in dry weather and bad in wet. From $2\frac{1}{2}$ miles (4 kilos) north of Pualaca a road passable for M.T. continues to Cribas.

34a. *Track Fatu-Berliu to Caicassa to Ailalec:*

Distance, 12 miles (19 km.). Time, 7 hours.

Difficult track northwest along a ridge crest except for a river crossing near the center which causes delays. Patchy air cover.

From Caicassa to Ailalec the track winds up and down and is very arduous for pony and man. The country in this tangled mass of hills is very fertile and cover is plentiful.

34b. *Track Soibada to Nova Caminha:*

Distance, 11 miles ($17\frac{1}{2}$ km.). Time, 6 hours.

Crosses broken country with some air cover, but mainly eucalypt savannah country. Difficult travelling.

34c. *Track Soibada to Laclubar:*

Distance, 11 miles ($17\frac{1}{2}$ km.). Time, 6 hours.

A bad track through fairly high ridge country and many small river beds. Fair air cover. Joins with track 33d. (via Pualaca) about 5 miles (8 km.) south from Laclubar. There is also an alternate short cut from this junction into Laclubar.

34d. *Track Soibada to Pualaca to Laclubar:*

Track is bad and follows bed of a tributary of the Borahun River. Then climbs a steep ridge to the junction with track 34c.

Track 35—Turiscas to Nova Caminha to Laclubar to Cribas:

TURISCAI TO NOVA CAMINHA:

Distance, 8 miles (13 km.). Time, approximately 5 hours.

The track is not difficult. Winds and climbs in places, but generally reasonable going over green hills, the track following the sides of the ridges. Exposed if aircraft appear from the flank. Sometimes very exposed when the track crosses a ridge. In other parts protection is fair. Gullies afford excellent shelter, but are mainly inaccessible to pony trains. Excellent all-round field of view from the trail. Water en route, safe and reliable.

Nova Caminha only a small village, but many natives and good supply of food in the district for up to 100 men.

NOVA CAMINHA TO LACLUBAR:

Distance, 10 miles (16 km.). Time taken, $5\frac{1}{2}$ hours.

The track winds over many ridges, but is a good one for pony transport. Cover is patchy. The track skirts a watershed and crosses the heads of many re-entrants.

LACLUBAR TO CRIBAS:

There was a good road between these towns, but has been destroyed by floods in 1939. A new route is now used which follows the river bed to $1\frac{1}{4}$ miles (2 km.) before reaching Cribas, where the road is a good M.T. wet weather road. Very open to aircraft.

35a. *Track Manatuto to Cribas:*

Pony track west of Manatuto-Cribas road. This track leaves Manatuto in a westerly direction and joins the North Laclo River. Following the main stream southwest until the Sumasse tributary is reached, which is followed until the main Manatuto-Cribas road is reached. It is a good pony track and air cover poor.

Track 36—Fatu-Berliu to Luca (End of Road 5a.):

FATU-BERLIU TO QUICRAS (CLACOC):

Time, 5 hours horse, 7 hours foot.

Good horse track, boggy, but passable in wet weather. From Fatu-Berliu the track swings southeast along a low ridge crest and drops down to the river bed, along which it travels for about 2 miles (3 km.). It leaves the river bed and goes southeast for approximately 8 miles (13 km.), approaching to within a mile to $1\frac{1}{2}$ miles ($1\frac{1}{2}$ to $2\frac{1}{2}$ km.) from the coast at Quicras. This portion of the track goes through dense forest from Fatu-Berliu most of the way to Quicras, and air cover is good except for several open patches. There are big coconut plantations near Quicras.

QUICRAS TO DILOR RIVER:

Good horse track. Boggy but passable in wet weather. From Quicras it swings northeast across the Clacoc Plain, crossing the Sahi River about 4 to 5 miles ($6\frac{1}{2}$ to 8 km.) northeast from Quicras, and maintaining this direction across plain country to the Dilor River. From Quicras to the Dilor River, the country is mainly grassland, with some lonthar palm and a few small patches of big

timber. Air cover is patchy. The track in the main is level and very bad in the wet season as this country is very boggy. There is also a poor branch track to Dilor River mouth.

DILOR RIVER TO LUCA:

From the Dilor River the track is still bad. It goes east and connects with the western spur of the south coast road about 7 miles (11 km.) east of the Dilor River. It crosses a number of small tributaries and creek beds. In the main its course is fairly flat and the vegetation is principally elephant grass, lonthar palm and a few patches of bamboo. Air cover is fair. The track is particularly bad in the wet season, when the ground is marshy and boggy.

36a. Track Sahi River to Maufai to Soibada:

Leaves track Quicras-Luca (36) one mile ($1\frac{1}{2}$ km.) east of Sahi River. Traverses grassland with patches of bamboo and nipa palm. Crosses Lamara River and then runs parallel with the Sahi River, where there are patches of air cover. Climbs gently, then steeply, and follows a ridge crest through open forest northwards for 3 miles (5 km.) to join track 37.

36b. Track Connection Dilor River Track to Quicras (36) with Track from Lacluta to Soibada (38) to the North:

Distance, approximately 12 miles (19 km.).

Going from South to North, this track leaves the Dilor River track about 5 miles (8 km.) on the western side of the Dilor River, going almost due north for about 8 to 9 miles (13 to $14\frac{1}{2}$ km.), and then swinging northwest. For the first 2 or 3 miles (3 or 5 km.) from the South it traverses open grassland country with patches of bamboo. From here it climbs low ridges, crossing one main river bed. There are fair patches of air cover from the plain northwards.

36c. Track Fatu-Berliu to join 36a.:

No information.

Track 37—Cribas to Lacluta to Viqueque:

CRIBAS TO LACLUTA:

No information available.

LACLUTA TO VIQUEQUE:

Distance approximately 18 to 20 miles (29 to 32 km.). From Lacluta for about 6 to 8 miles ($9\frac{1}{2}$ to 13 km.) the track makes its way over small water-courses and rolling ridges. At Radi-Uma there is a good rest house and coconut plantation. Crossing the Radi-Uma, it climbs steeply over a dividing range, drops down to the Be Aris River, and from here into Viqueque it crosses about four fair river beds with their attendant dividing ranges, and comes in on the south coast spur road 2 miles (3 km.) west of Viqueque. Air cover is fair throughout this eastern portion of the track.

This track is now in bad condition and much more difficult to pass.

37a. Track Ossu (Belas) to Bibileu:

Time for journey, 6 hours. This track travels southwest from Ossu over hilly country. Air cover is good.

Track 38—Soibada to Lacluta to Laleia:

SOIBADA TO BARIQUE:

Five hours' walking.

Poor horse track. Descends steeply to Sahi River with many steep climbs. Not much timber cover. Tall grass country, but little timber. River might delay traffic for one day.

BARIQUE TO LACLUTA:

Seven hours' walking.

Similar bad going for foot or horse traffic, with more forest towards Lacluta.

The country is very steep with one particularly steep hill. Track crosses two fair river beds on this portion of the journey with a fairly high divide of nearly 1,000 feet (275 m.) between them. There is patchy air cover for this portion of the journey, mainly through grassland and forest.

Rubber plantation at Lacluta.

From here the track works its way along a ridge crest for about 9 to 10 miles ($14\frac{1}{2}$ to 16 km.). The vegetation is forest and open grassland; air cover is patchy. The track drops fairly sharply from this ridge to a river bed and traverses the river flat for about 10 to 11 miles (16 to $17\frac{1}{2}$ km.) right into Laleia. There are patches of good air cover along this river valley.

Track 39—Venilale to Vemassee:

Distance, approximately 15 to 17 miles (24 to 27 km.).

From Venilale the track goes northwest and for about 7 to 8 miles (11 to 13 km.) works its way along the valley along which there is good air cover.

From the valley it climbs up a fairly steep ridge, which it traverses for about 3 to 4 miles (5 to 6½ km.). There is little air cover along this ridge and the track is open. At the end of the ridge, which is over 1,000 feet (300 m.) high, it winds down along spurs and makes its way into Vemassee. There is little air cover along this latter portion of the track, excepting at creeks and in valleys, where there is a fair growth of casuarina.

39a. Track Venilale to Seical River:

Venilale is the same town as Vila Vicosá. The correct position is where Venilale is shown on the map.

A horse track only. This track joins the Seical River after 4 hours' march. At the river the track follows its banks all the way until the main road is reached. A good track all the way, as heavy rains do not affect the track. The whole of the distance can be done in 8 hours on foot.

39b. Track Mundo Perdido to North/South Road (Road 5):

Distance, about 4 miles (6½ km.).

This is a short spur track to the west of the south coast road from Baucau to Beasso. In the main it traverses the northern slopes of a ridge crest which is about 2,400 feet (750 m.) above sea level. The surrounding country is very heavily timbered, dense forest, and there is complete overhead canopy except for the first mile (1½ km.), which is open grassland.

Track 40—Ossu to Leca to Aliambata:

Distance, approximately 17 to 20 miles (27 to 32 km.).

This track crosses about 8 to 10 river beds in its total distance. Between these river beds are moderately steep hills, and in places the grade would be 1-3 to 1-4. Except for a patch of about 2 miles (3 km.) which lies some 7 miles (10 km.) to the east of Ossu, there is thick growth of forest on both sides of the track and air cover is very good.

40a. Track Ossu to Road Beasso to Aliambata (6):

Distance, 13 to 14 miles (21 to 22½ km.).

This track branches off the track Ossu-Aliambata at about 2 miles (3 km.) to the east of Ossu, swinging south and dropping down a spur for about 2 miles (3 km.), from whence it traverses a river bed for a short distance. It then climbs steeply over a ridge about 3,000 feet (900 m.) high, and drops down on the southern side, finally coming in about midway between Beasso and Aliambata on the south coast road. The first two or three miles (3 or 5 km.) air cover is very good. For the next 10 miles (16 km.) it is patchy, being quite good in places and open in others.

Track 41—Fatu-Maca to Uai-Tamo:

Distance, approximately 20 miles (32 km.).

This track works its way across ridges separating tributaries of the Seical River for about 4 miles (6½ km.). From the main river crossing it follows one of the tributaries for about a further 4 miles (6½ km.), then climbs a ridge and one mile south descends again to another branch of the river. From here the track winds up a spur and generally travels in a southerly direction, keeping for the last 3 or 4 miles (5 or 6½ km.) exclusively to ridge crests. Except for the crossing of the Seical River, air cover is not good for the first ten miles (16 km.). Thereafter it is patchy, being good at the creek and river crossings, which are very numerous. Approaching its most southern point, air cover again becomes good for about 1½ to 2 miles (2½ to 3 km.).

41a. Track 41 to Aflicai-Bagua (Track 42):

This is a short connecting track of about 5 miles (8 km.) in length. It travels mainly along a ridge crest, where air cover is moderately good. Shortly before reaching Aflicai (Baguia) there is a patch of about 1 mile (1½ km.) of dense forest through which the track goes, and here air cover is very good.

Track 42—Aflicai-Bagua to Fatu-Maca:

Track crosses approximately six ridges and creeks through good air cover to the junction of the track going north and south, then follows ridge crest, descends to a tributary of Seical River, which it follows for 2 to 3 miles (3 to 5 km.). Air cover fair. Then crosses the Seical River, which is fairly wide with good growth of casuarinas (she-oaks). Then climbs to a ridge crest which is followed for 2 miles (3 km.) into Fatu-Maca.

42a. Westerly Track Leca to Aflicai-Bagua:

Distance, about 9 miles (14½ km.), starting northwards from Leca, and working across broken ground for 3 or 4 miles (5 or 6½ km.). It climbs a fairly steep ridge, drops to the other side, crosses a small river bed, and then swings southeast to join the Aflicai-Bagua to Aliambata track. Patches of this track are very steep. There are two sections where air cover is very good; one section is about 2 miles (3 km.) in length and about 1 mile (1½ km.) north from Leca, the other section, which is also about 2 miles (3 km.) being just

before the main track is joined. For the remainder of its length there are patches of moderately good protection.

42b. Track Leca to Road 6, East of Aliambata:

Distance, 5 to 6 miles (8 to 9½ km.). This track travels through level country, and there is only one river crossing near its junction with the south coast road. It passes through a dense growth of forest and undergrowth and air cover is very good.

Track 43—Viqueque to Ossu-Lari to Road 6:

Track travels east, crossing three or four river beds with attendant divides. Fair air cover. From Ossu-Lari for 3 miles (5 km.) east it traverses grass and forest land with patchy air cover. Then for 2 miles (3 km.) through dense forest growth to join Road 6 (Beasso to Aliambata).

43a. Track Viqueque to Ossu-Lari:

Two miles (3 km.) south of track 42. Similar conditions.

Track 44—Baguia to Uato-Carabau:

Distance, 8 miles (14½ km.).

From reports it appears that this is a very tiring track. It goes up and down across ridges and tributaries of the Selibere River.

44a. and 44b. Tracks Uato-Carabau to Road 6 near Irabin River:

Distance, about 7 miles (11 km.), and lies to the east of and parallel with another track that also comes in on the south coast road about a mile (1½ km.) west. Both these tracks traverse low rolling country, and neither have any important rivers or crossings. In the main they are fairly open for the first mile or two (1½ to 3 km.), and air cover improves and is moderately good until about a mile north of the coastal road, when air cover is very good.

Track 45—Calicai to Belicasse:

From Calicai to Belicasse the track is suitable only for pack animals or foot. Air cover is not good, and the track itself winds along the northern slopes of a ridge which is nearly 3,000 feet (900 m.) in height.

Track 46—Baguia to Luro to Fuiloro (Vila de Avis) Road 4:

Distance, approximately 35 to 38 miles (56 to 61 km.). In the main this track runs roughly northeast along the center of the eastern end of the territory. From Baguia the track works along the ridge eastwards, drops down to the crossing of a river, which might delay movement for an hour or so after rain, climbs up a spur on the far side, which it traverses for about 2 miles (3 km.), and for the next 12 or 14 miles (19 or 22 km.) it crosses creeks and ridges on the southern side of a fairly high range. The track is from 2 to 4 miles (3 to 6½ km.) distant from the range crest throughout this portion of the journey. From Baguia for about 1 mile (1½ km.) there is very good air cover. This dense forest growth gives place to open forest and grassland, which provides moderately good air cover for the remainder of the track length for about 3 miles (5 km.) before reaching Fuiloro, where the track goes through open grass plain. Cover is very good at all creek crossings. At a track junction, which is also the posto, Luro, the track swings slightly south of east for 2 to 3 miles (3 to 5 km.), then continues its generally northeasterly direction over low rolling hills and re-entrants to Fuiloro. This track is suitable for horse pack or foot in all weather.

46a. Track Fuiloro to Com to Loiquere to Tutuala Road 4:

FUILORO TO COM:

Five to six miles (8 to 9½ km.) through high country. Track not suitable for M.T., and it is said that a motor road to the potential airdrome near Fuiloro would be difficult to construct.

COM TO LOIQUERE TO TUTUALA:

Track parallels the coast east from Com to Loiquere. It crosses several small streams and has patches of good air cover. From Loiquere it swings south for 2 miles (3 km.), then east/southeast to join Road 4 about 4 miles (6½ km.) west of Tutuala. Latter section has fair air cover and is moderately flat.

Track 47—Loitafi to Uato-Carabau to Iliomar:

LOITAFI TO UATO-CARABAU (NOVA BEMFICA):

Distance, 6 to 7 miles (9½ to 11 km.). For the first two miles east from Loitafi, which is through mountainous country with some steep grades, and a couple of short river crossings, the air cover is very good. After this second river is passed the track climbs to a ridge crest and works its way eastwards. Here the country is more open, the going more level; air cover is patchy.

UATO-CARABAU TO ILIOMAR:

This track goes eastwards along a ridge for about 3 miles (5 km.) from Uato-Carabau, then it drops down and crosses four river beds. The first and last of these drain a fairly considerable area of ground, and would delay

traffic for at the most a day. The other river beds that lie between these two would not be serious hold-ups. These four river beds are passed within a space of 2 miles (3 km.). After crossing the last stream, which is a branch of the Ira-Bere River, the track works its way across ridges of about 800 to 1,000 feet (250 to 300 m.) high, and swings north for about 2 miles (3 km.) from Iliomar. This track is suitable for horse traffic in all weather. Air cover is fair, except on a few portions of the ridge crest.

47a. Track Loitafi to Baguia:

Distance, 7 to 8 miles (11 to 13 km.). This track crosses six streams in its short distance. Between these river beds are spurs from the Mata-Bia Range, and the grade in places is very steep. Throughout its entire length it goes through dense forest, which has uniformly good canopy. Air cover therefore is very good.

Track 48—Elomar to Iliomar to Luro:

Distance, approximately 27 miles (43 km.). North from Iliomar, which is about 7 miles (11 km.) northeast from Elomar, the track works over broken ground for 6 to 7 miles (9½ to 11 km.) climbing steeply in places. After about 6 to 7 miles (9½ to 11 km.), it crosses the highest point of the route, which is 2,700 feet (825 m.) above sea level. From here it goes north for a couple of miles (3 km.), then swings to the northeast for about 2 more miles (3 km.), winding around the contours of the ground, and crossing the re-entrants or heads of several small watercourses.

After this 2 mile (3 km.) stretch, the track swings generally north, continuing to follow the contour of the ground, but gradually falling to Luro.

48a. Track Luro to Lautem (Road 3):

Distance, approximately 8 miles (13 km.).

This is a short connecting pack track going southwest from Lautem to join the spur road from the south coast. In the main it traverses flat country, and except for the crossing of the Malai-Lada River, would present no difficulties in any period of the year. The country traversed is very low rolling hills, covered with patches of forest and open grassland. Air cover is patchy.

Track 49—Iliomar to Loré to Beru to Tutuala:

Distance, approximately 37 miles (59 km.). This track goes east to Loré, thence northeast and parallel to the coast to Beru. From Iliomar east to the Chino River it traverses flat country, along the road from Vei-Laiyai and Dai-Name to Loré. Throughout the whole of this stretch of road there is dense forest with thick undergrowth, and the only difficult crossing might be at the Chino River, where traffic could possibly be delayed for one day after heavy rain. This track could be made a useful road with very little work. It has been formed for such and is about 15 to 16 feet (4½ to 5 m.) wide. At Loré this track connects with the most easternmost cross-island road, and continues close to the coast to Beru. From Loré to Beru it crosses the mouths of many small creeks, none of which would seriously affect pack animals or foot troops in wet weather. Throughout the whole of this section of the track air cover is very good, as the country traversed is all dense forest. No information Beru to Tutuala.

Track 50—Fuiloro to Aramacu River:

Distance approximately 13 to 14 miles (21 to 22½ km.). From Fuiloro southeast for about 8 miles (13 km.) this track goes through open country with no air cover. The going is level and walking is easy. On reaching Mua-Pitine the track swings northeast for about 2 miles (3 km.), then turns southeast to the Aramacu River. This southeast portion of the track has good air cover. Plenty of water in the wet season.

There are also two pony tracks from Mau-Pitine to the main Fuiloro-Tutuala road. Both of these tracks cross the Lautem Plateau west of Lake Ira-Lalaro through open country. Little information is available.

SECTION IX—TRANSPORT

1. General:

There are no railway systems in Portuguese Timor, and transport is almost entirely by means of ponies and carriers, except along the north coast road, where M.T. is possible.

Because of the uncertainty of being able to effect crossings of rivers, M.T. has not been widely used, and the cars and trucks in Portuguese Timor would probably be not more than 20-24 before the Japanese arrived. No rivers are navigable, and very little transport is done by water.

The Timor pony will take a load of 100 lbs., and it should not be overloaded. It has a speed of about 2½ miles an hour on an average, and it can maintain this for long periods. Normally, only males are used for transport, and these are always stallions, the mares being kept for breeding. Mares were used by our troops for transport. The loading of a Timor pony, which stands from 8-10 hands high, is either by pannier or packed on to a wooden saddle. Saddle sores are a constant source of trouble. There are no statistics as to the number of the animals, but it is known to be very considerable. In many districts it is estimated that there would be more than one pony for each family in the area. Timor ponies are extremely hardy and live off the country. They are tethered for grazing when not turned out to run in the hills. If grass is not plentiful, they are fed with maize or grain. This is particularly necessary when engaged in heavy work.

Note: The Japanese brought to Timor some Australian type horses which they had taken out of Singapore. Some of these horses died shortly after being put to work in the hills. They were probably mismanaged and not fed, but even so this illustrates the well-known fact that the local ponies will stand up to the arduous conditions and non-nutritious pasture much better than imported animals. Mules also have been tried on several occasions, but reports on the results are conflicting.

2. Native Carriers:

Before the start of the native wars in Timor, when the Portuguese administration was still functioning, it was possible to line up 100 carriers within an hour's notice at any of the larger and more co-operative postos. The natives are excellent porters, and for hours on end can carry 40 lb. loads on their heads. They must be well fed, as food shortage may cause desertions. Pay for the native carriers would be 10 avos. (2d.) per day in the beginning, but towards the end they were earning 2d. per hour. As the wars became fiercer, the natives left their homes and herds and crops and went away to fight. Consequently portage is now a big problem in Timor. The only really reliable natives now are the creados (servants).

SECTION X—RIVERS

The rivers for the most part flow north and south from the watershed, which runs approximately down the centre of the island. Their courses are, therefore, generally "consequent" and short, and the considerable elevation of the mountains makes them steep in slope and fast in flow.

Exceptions to this principle can be seen, of course; firstly in the northwestern part of the colony, where east-west ridges have engendered a "subsequent" drainage pattern where the streams flow in between the longitudinal ridges and only break through to the North at certain narrow gorges. Secondly, there is an area of inland drainage on the Lautem Plateau. Thirdly, when the streams reach the southern coastal belt of about 5 to 7 miles (8 to 11 km.) width of low flat country, many of them become sluggish and meander into swamps.

The effect of the seasons on the rivers is most marked; along the north coast many of them dry up completely between June and November (the dry season) and only run periodically in the wet. In the northwestern area and on the south coast some of the major streams maintain a perennial flow. In the wet season torrential floods are common occurrences. Many of the stream beds are extremely wide and covered with boulders rolled down from the mountains. The North Laclo, for example, though only 40-50 miles (64 to 80 km.) long, has a bed up to 2 miles (3 km.) wide at its mouth. This bed, of course, is but rarely filled, and normally flow is confined to several narrow channels.

In the dry season the beds could be used by A.F.V's., and in many instances tracks follow the watercourse for quite a considerable distance. In all cases they are gravelled and well scoured out. The banks vary from very steep, with heights of bank from 10-30 feet (3 to 9 m.) and in a few instances 60 feet (18 m.), to just low easily graded slopes. In appearance, most of these streams are like the small creeks which come down from the eastern side of the ranges along the coastal district of eastern Australia.

The capricious nature of Timor rivers has been the despair of road-menders. Rushing down in full spate after one of the downpours of the northwest monsoon, they "often change their course at random and nullify the efforts of the bridge-builders laboriously trying to repair the damage of a previous flood." When in 1938 a large number of low-

level bridges had been incapacitated by a series of floods, the Government of Portuguese Timor resolved to break off this unequal contest with nature and build no more.

None of the rivers is navigable, except just at their mouths, and then only for small native craft.

In respect of road communications, they possess a very considerable nuisance value. All rivers would be an obstacle to M.T. or tanks when in flood. A flood may last anything from an hour to 2-3 days in some of the bigger streams, and even to weeks in extreme cases. Men on foot should be cautioned against attempting passage of the rivers in flood if the water is waist high, as all rivers are extremely swift and a man would be easily swept off his feet by the weight of water.

The rivers are liable to flood almost immediately after heavy rains. It is known for rivers to come down in a wall of water and carry the unwary traveller away before he can reach the other side. Particularly serious offenders are the Comoro and North Lacio, as well as the host of smaller streams going down to the north coast. The town of Aipelo was practically obliterated by such floods in 1936-37.

Crocodiles are prevalent in the lower reaches of many of the rivers.

Irrigation:

The waters of many of the rivers are used by the natives for irrigating rice fields.

SECTION XI—LAKES AND SWAMPS

There is only one large lake on the island, Lake Ira-Lalaro (also called Surubec). It occupies the eastern part of the Lautem Plateau, an area of inland drainage. In the wet season this lake is up to 10 miles (16 km.) long and 5 miles (8 km.) wide, but it is shallow and an immense growth of reeds flourishes. Even in its centre it is not believed to be deep. In the dry season the lake shrinks gradually to a fraction of its former size, and only extensive swamp and mud-flats remain. It has been reported on as definitely unusable for flying-boats.

There is a small lake also on the Balibo Plateau, again in an area of inland drainage, but in this case the lake is no more than 1 mile (1½ km.) across.

Several semi-tidal bays, lakes or salt-pans occur along the north coast, as between Tibar and Dilli, at Salgueiros (meaning "salt-pan" in Portuguese) and Lamsana, east of Manatuto, and also east of Laga.

Swamps are plentiful along the south coast. They are commonly associated with river mouths and have fairly large lagoons in places. Especially bad swamps, 4-5 miles (6½ to 8 km.) across extend along the coast southwest of Suai. There are others from the mouths of the Clerec past the mouth of the Dilor to the Cuac, a distance of about 30 miles (48 km.). These swamps do have interruptions here and there, and are not more than 1 to 3 miles (1½ to 5 km.) across. There are also a few small swamps on the coastline near river mouths between Beasso and Elomar. These marsh areas are the feeding grounds of the water buffalo and infested by crocodiles and mosquitoes. They would present no difficulty to troops' movements during any season, but in the wet weather would impede movement by tanks or M.T.

SECTION XII—MOUNTAINS

To the infantryman, Portuguese Timor is one lunatic, contorted, tangled mass of mountains. There is no main system of ranges, for the mountains run in all directions and fold upon one another in crazy fashion.

The mountains determine that warfare in Portuguese Timor must be of a guerilla nature. The few roads are often unserviceable. Both roads and tracks are liable to be washed away by the huge volume of water which rushes down the steep mountain slopes during the wet season. The natives are skilled in the making of graded tracks, but for the most part the tracks are very steep and reduce the vitality of troops considerably. In some parts of the island the hills are lower and rolling, but here, too, the constant going up and down is very wearying. Travelling across country in Timor is generally impossible, and the fact that armed parties must stick to the tracks has a large tactical bearing on the campaign. In Portuguese Timor one geographical feature, mountains, determines the whole nature of life and fighting on the island.

The topography is complex for such a relatively small area. It may conveniently be divided into four physiographic regions.

a. The Northwestern Area, being Dilli Province, the north of Fronteira and Suro, and northwest Manatuto.

b. The Central Divide Area, the central parts of Fronteira, Suro and Manatuto.

c. The Eastern Area, Sao Domingos and Lautem Provinces (combining from topographical types).

d. The South Coast Area, Fronteira, Suro, Manatuto and Sao Domingos.

The line of the highest elevations in the main is formed by the Central Divide and an east/west line through the eastern area. The highest point rises to over 9,000 feet (2,920 m.).

The Northwestern Area is a very mountainous part, with regular east/west ridges, only cut through here and there by north/south valleys. It is consequently difficult to traverse. Relatively slight uplift of the land in relatively recent geological times has exposed narrow coastal flats. There is, nevertheless, very little regular coastal plain along this section of the north coast, and the foothills often come right down to the sea, except where there is river alluvial as well, as at Dilli, Liquissa, etc. The main east/west communications consequently hug the coastline.

The Central Divide Area is the most elevated, and the watershed follows a NE/SW trend. The mountains are extremely steep and high, but the foothills are gentler and more fertile than in the northwestern region. Transport is extremely difficult, both roads and tracks having normally to follow the ridges when possible and to zigzag over the mountain passes and cross deep valleys.

The Eastern Area consists of two large plateaux (Baucau and Lautem) and a hilly area of rather similar nature around Viqueque. In Sao Domingos there are two east/west mountain ridges cut off to the East by a north/south ridge.

In western Lautem Province there is a NE/SW ridge with a track which runs south of the Lautem Plateau. The hills die away to the North.

Finally there is the South Coast Area which extends from the frontier to Beasso. It consists of foothills and rolling savannah plains up to 6 or 8 miles ($9\frac{1}{2}$ or 13 km.) across. Much of the coastline consists of mangrove swamps up to a mile ($1\frac{1}{2}$ km.) wide.

Geomorphologically speaking, Timor is a highly complicated island. Its physiographic appearance reflects its varied geological history (See Map, page 59).

In the latter, six major stages can be distinguished: Hard ancient rocks, soft sedimentary rocks of the secondary age, hard white "Fatu" limestone of the same age, extinct volcanic rocks, younger limestones and shales, and alluvial flats.

Each of these types weathers into a characteristic physiography, according to their hardness and texture. They are each associated with certain distinct areas. On the Portuguese half of the island, therefore, is recognised:—

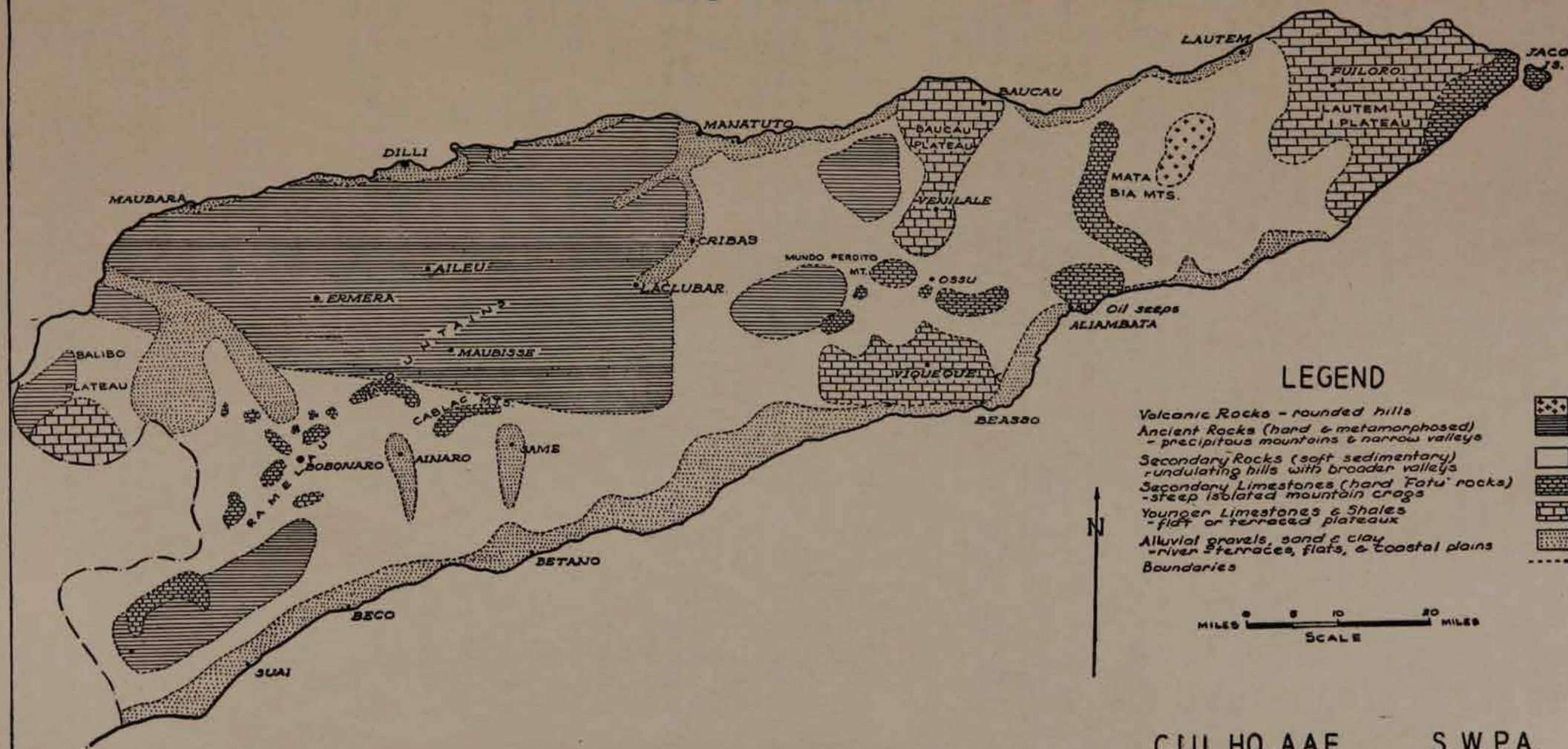
a. An area of **ancient rocks** occupying the whole of Dilli Province, northern Fronteira, Suro and northwest Manatuto, cut off by a sharp line to the south and east sides. The region is one of high mountain chains running east/west, deeply dissected with young V-shaped valleys, with but few north/south openings cut by the rivers. The main range is from Maubara behind Dilli-Manatuto. South of it another runs through Taco-Lulic to east of Aileu; a third from Ermera to the East. These ranges branch and bifurcate, but their general trend is east/west.

b. The principal rock material for the rest of the colony is the **soft secondary sediments**, which weather away quickly, leading to landslides and impermanent tracks. Their general plan is not systematic; rather do they produce a dissected hilly country with no dominant tracks, but highest towards the central backbone of the island.

c. This type of rock is covered in places, however, by a number of other types, which influence the topography most strikingly. First, there is the **hard white "Fatu" limestone**. "Fatu" (Batu, Uato or Hatu) means a white rocky crag or mountain in the local dialects. This describes the scenery well. These crags stand up vertically on the landscape; they are often unscalable, they are so steep. They may be from a few hundred yards up to tens of miles long. The white limestone rock material is very hard, and they form the highest mountains in the island. These are strewn along the top of the central backbone of the island, like plums along the top of a long cake. They extend from Mt. Taroman (5,730ft. : 1,746 m.) in the southeast, to Mt. Cailaco (6,060ft. : 1,848 m.), here and there along the Ramelau Range to Mt. Tata-Mailau (or Mt. Ramelau) the

GEOMORPHOLOGICAL SKETCH MAP

PORTUGUESE TIMOR



C.I.U. HQ. A.A.F.

S.W.P.A.

highest point on the island (9,600ft. : 2,920 m.) and the Cablac Ridge (8,100ft. : 2,472 m.). Then there is a gap in Manatuto Province, where the hills are less rugged. The "Fatu" limestone appears again in the Mundo Perdido (5,880ft. : 1,790 m.) above Ossu and near the eastern boundary of Sao Domingos Province in the Mata-Bia Range (which, contrastingly, trends north/south). Finally it reappears in the rugged mountains southeast of the Lautem Plateau and has its swan song in Jaco Island. This sort of topography is most unusual and only found in Timor.

d. The second type of modification on the basic plan of the island is afforded by **younger limestones and shales**, partly capped by upheaved relatively ancient coral reefs. This forms flat plateaux and high terraces. There are three principal ones, the Balibo Plateau in the West, the Baucau (or Salazar) Plateau in the centre, and the Lautem Plateau in the East. Though these areas are generally flat, they are marred by small projections of coral rock and scattered with pot-holes leading to underground streams and caves. A small area of this rock in the basin of the Cuac River ("Cuac" means "caves") has enormous caves, which were of great use to Sparrow Force in 1942. Similar caves at Baucau are used by the populace for air-raid shelters.

e. Thirdly, there is a small area of **volcanic rock** from some extinct volcanoes in northwest Lautem, with the usual conical-shaped hills and good soil.

f. Finally, there are the **alluvial flats**. There are two varieties—the valley gravels and the coastal clay flats. The former are important as offering well-drained flat areas for possible airdromes, e.g., the upper valleys of the Lois (and Nunura Plains) of the Be-Lulic (near Ainaro) of the Sue (near Same), of the Sumasse (near Cribas). The coastal flats are mostly confined to the south coast and are up to 6 or 7 miles (9½ or 11 km.) deep. They are generally black soil, although sandy patches occur. For the most part they are waterlogged in the wet season.

SECTION XIII—VEGETATION

Because of relatively low rainfall, the vegetation is markedly more similar to the Australian than to the New Guinea type. Eucalyptus and casuarinas ("she-oaks") are common, and much of the northern side of the island is open savannah country similar to the semi-arid regions of northern Australia. Elsewhere the vegetation is more akin to that of Australian eastern coastal belt.

The range of vegetation types is extremely wide, varying from rain forest to semi-desert cactus and scrub. A very general picture of the distribution of the main types is given in the Map, page 61.

1. Rain Forest:

This is more similar to the Australian "Rain Forest," "Brush" or "Scrub," with fairly complete overhead canopy and dense undergrowth, than to the New Guinea Rain Forest, which has complete canopy and relatively little undergrowth. It is confined mainly to the patches along the southeast coast and in pockets on the southern slopes. It is not distinguished as a separate type on the map.

2. Dense Forest:

This is found under less extreme conditions of rainfall, and typically has less complete canopy and less luxuriant undergrowth than Rain Forest. It is fairly widely distributed, particularly in the river valleys.

3. Savannah:

Grass country with scattered trees which vary in density from isolated trees to open forest. The characteristic feature is the grass cover. Much of this country is very steep.

This is the main class shown on the Vegetation Map.

Towards the more arid regions of the north coast, the savannah merges into semi-desert types, mainly cactus and scrub. Similarly, towards the eastern portions of Lautem Province, savannah (and grassland) gradually changes into low scrub, usually about two feet ($\frac{2}{3}$ m.) high.

It has not been possible to differentiate these types on the vegetation map, and all are shown as savannah. A further type, also shown as savannah, is country with alternating clumps of forest and open grassland.

SCALE OF MILES

10 5 0 10

VEGETATION, BOUNDARIES APPROXIMATE ONLY

DENSE FOREST USUALLY WITH THICK UNDERGROWTH. 00 00

SAVANNAH OR SCATTERED CLUMPS OF FOREST. 00 00

OPEN GRASSLAND. 00 00

1 FEBRUARY 1960

ALIND GEOGRAPHICAL SECTION

VEGETATION. BOUNDARIES APPROXIMATE ONLY

DENSE FOREST USUALLY WITH THICK UNDERGROWTH. 00 00

SAVANNAH OR SCATTERED CLUMPS OF FOREST. Q. Q.

OPEN GRASSLAND-----⁸ H V

1 FEBRUARY 1943

ALLIED GEOGRAPHICAL SECTION

4. Open Grassland:

There are considerable areas of open grasslands and also innumerable small areas not differentiated on the map from the savannah country.

The inland grass country is in many respects similar to the coastal grasslands of Eastern Australia, with reasonable grazing value for horses and cattle. In other parts, particularly along the coast, the grass is much coarser with "blady" grass and elephant grass prominent.

5. Swamp and Stream-bank Vegetation:

Casuarinas are a very conspicuous feature both along the banks of rivers and streams and fringing the long narrow swamps immediately behind the south coast beaches. Behind the casuarinas, the swamps are often covered with mangroves or reeds. Further inland is lonthar palm, sago palm, elephant grass and clumps of bamboos. These clumps are up to a mile (1½ km.) across in places, and are often so dense that they are impenetrable even on foot.

SECTION XIV—SIGNAL COMMUNICATIONS

1. Telephone System (See Map, page 63):

There was a magneto telephone system linking most postos with their provincial capitals, which are themselves linked to Dilli. Dilli was connected by telephone to Koepang in Dutch Timor through Atamboea, and also with the Ocussi. The system has been reported as being apparently reliable, but it is known that long distance communication is very poor. On the inland lines it is not an unusual thing to have to relay long distance messages from posto to posto in turn. The lines were single wire on wooden poles of eucalypts about twelve inches (¾ m.) diameter, thirty feet (9 m.) high and spaced about thirteen chains (260 m.) apart. The wires were of insulated steel, not copper.

The telephone system from Lete-Foho to Hatu-Lia, Hatu-Lia to Ermera and Ermera to Dilli was destroyed by our forces in June, 1942. Much of the system has been destroyed by the Japanese, and in Dilli they removed nearly all telephones. It is probable that the system could be restored fairly rapidly.

Dilli is not linked with any other place by cable.

2. Postal System:

The postal service is effected by native carriers, and it was hoped to open up an overland service with Koepang once or twice a week. Mail would then have been carried by horseback to Atamboea in Dutch Timor and thence by car to Koepang. The post office at Dilli is probably the only post office in Portuguese Timor.

3. Wireless Stations:

It is believed that the original radio station at Dilli was erected by the Royal Australian Navy during the war 1914-18. Two substantial steel masts about 230 feet (70 m.) in height and a large building adjoining, together with some old generator engines and radio panels, were in existence until recently, and the masts and buildings were used for the transmitting station. These buildings and the masts were sound and sufficiently large to accommodate any type of radio transmitting and receiving equipment (including generating plants) ever likely to be required at this locality.

The site of this station is in the post office building, which is immediately west of the customs house and near the Dilli jetty. It is thought to have been damaged, if not destroyed, by recent Allied bombing (See Photo No. 16).

The site of the present Japanese W/T station, however, is between Lahane and Tai-Bessi.

SECTION XV—RESOURCES

1. Foodstuffs:

a. Crops:

In respect to agriculture, Portuguese Timor can be divided into three zones, viz.:—

- i. Dry and arid north and east section, with typical thorny vegetation and jungle scrub—unsuitable for agriculture.

PORTUGUESE TIMOR

SHOWING TELEPHONE COMMUNICATIONS & POSTOS

INFORMATION FROM CAPT. D. DEXTER.
TRACED BY ALLIED GEOGRAPHICAL SECTION. 22nd JAN 43

10 0 10 20 30 40 50 Kilometers



ii. Central mountain region, with grassy slopes (1,200 square miles); relatively few valleys contain extensive fertile soil. Near Ermera there are some good hill soils suitable for cultivation.

iii. Elevated plains in the middle section of the south coast—more Malayan in character. These plains contain nearly all the land suitable for further extensive development.

The following foodstuffs are produced in the area: rice, maize or corn, coffee, European fruit and vegetables, sweet potatoes, potatoes, beans, tobacco, copra, peanuts, arrowroot, manioc, tea and oranges. Rice is the staple diet of richer natives, but maize is the real basis of the native food supplies. In general, the coastal villages are very poor compared with those in the hills, as there is less agriculture and practically no coastal fishing or fish in the rivers. Even in the hills the natives are not agriculturists but primitive horticulturists; tillage is by digging sticks. They are also lazy, so that the total of food reserves is small and sporadic. This has been further accentuated by the military operations, and food supplies in the near future are certain to be inadequate even for the local inhabitants.

Abundant quantities of rice can be grown, but it is unlikely that appreciable supplies for feeding troops would be available from native sources. In Lautem, Baucau and Manatuto rice is grown everywhere; in the other provinces, principally at Cailaco, Atsabe, Beco, Alas, Same, Ainaro and Hatu-Udo. Maize thrives both on the slopes and in the mountain regions; it is grown everywhere and in varying quantities. Soya beans are also grown on a moderate scale, and are the second main standby in the natives' diet. Coffee will grow anywhere above an altitude of 2,500 feet (760 m.) and flourishes in the northwest mountain region. It was the chief export of Portuguese Timor. The Ermera district produces some of the best coffee in the world; Bobonaro, Atsabe, Talo, Maubisse and Aileu are other coffee districts. Copra is produced for home consumption and export. Tea is grown at Hatu-Builico, Maubisse, Lete-Foho, Cablac and Goulau (native village of Hatu-Udo). European types of fruit and fresh vegetables can be grown—the quantity is small and they are scarce in the dry season. Oranges flourish at higher altitudes; onions flourish and some are even exported. The sago palm is rare and found mainly on the low-lying parts of the south coast. Wild honey is available in small quantities, particularly in Suro Province at Ainaro and Hatu Udo. Pineapples, bananas, mandarins, paw-paw, mangoes, guavas and a little sugar cane are all common in season.

b. *Livestock:*

Water buffalo, goats, pigs, deer and fowl are all available as sources of food.

Water buffalo are plentiful—mainly in Lautem and Baucau Provinces. The majority of these are domesticated, often running free in herds.

There are also many wild buffaloes (unestimated number), mainly in south Hatu-Udo, Nunura Plains, Alas, Fatu-Berliu and Viqueque regions. Haphazard shooting of water buffalo should be discouraged, as most herds are privately owned by natives. The wild animals can be distinguished by the absence of ear marks, always in evidence on domestic beasts. The natives will readily give assistance in rounding up wild herds. The buffalo yields both flesh and milk; the milk is quite palatable, though strong at first.

Deer are very plentiful on the Nunura Plains and all along the southern slopes, but there are only a few on the north coast.

Goats, pigs and fowl are plentiful. These are domesticated and wander at will through native huts and villages. Goats are used for meat and milk. Pigs are very numerous, but no statistics of numbers are available. There are, in addition, a few wild pigs; in some districts these are inclined to be wormy (measly pork). See Section XVIII, para. 2.

There are a few sheep near Baucau.

2. *Fuel:*

a. There were no oil storage tanks in Dilli a year ago; all petrol, oil, etc., was stored in drums. The fuel store (main petrol store for territory) at Dilli was adjacent to the lighthouse on the shore side of the northwest harbor entrance.

There are two districts—South Coastal and Manatuto area, where the geological conditions are favorable to the production and accumulation of petroleum. There are gas vents and oil seepages where good indications have been obtained but have not yet been exploited. Aliambata (primitive refinery), Ira-Bin and Cribas are of primary importance; other possible areas are Nova Bemfica, Tualo, Manatuto and Cribas. There is a large

oil soak at Manatuto which produces 80 gallons per day. A bore at Aliambata gave a stream 6 inches ($\frac{1}{2}$ m.) in diameter and 60 feet (18 m.) high, but an accident with the casing stopped the flow. There is a government refinery which produces 8 tins of kerosene per day from what natives skim off water with bamboos. Oil obtained from Betano on the south coast was used as a timber preservative. (There were about 100 motor cars in Portuguese Timor, 30 of which were in Dilli.)

b. Coal occurs in various localities; there are three outcrops in Loi-Lari. There is a small outcrop at Bobonaro (Vila Armindo Monteiro), but this is too high in sulphur content to be of value.

3. Water:

Portuguese Timor is not as dry as the Dutch Territory. There is seldom a shortage of drinking water in the dry season in Portuguese Timor, as there are many wells and more rain and water in the rivers than in Dutch Timor. Water is in abundance throughout the southwest corner—that is, from the border of Portuguese and Dutch Timor to Dilli, and from a direct line due south to Rai-Mean, excepting for a few miles inland from any part of the coast.

Water may be obtained from a spring on the coast at Tibar and from wells in the Dilli area, as well as from the Dilli town supply. The latter comes from three reservoirs half a mile inland; these reservoirs depend for supply on two rivers. There is only a scanty supply of well water between the Comoro and Dilli. The Comoro is fresh water, but muddy. East of Dilli, besides the non-perennial waters, there is only well water. There is well water one mile ($1\frac{1}{2}$ km.) west of Hera and good water in the hills at San Francisco. Natives use special spring water in preference to creek water, and places are indicated by bamboo sticks upright in the ground showing approaches to sources of water. The water in the rivers is particularly cold, and natives bathe and wash their clothes in them.

Australian troops boiled water for drinking purposes from wells in the districts of Dilli, Tibar and Aipelo. This was not a practice in the hills, where good spring water was always available.

4. Minerals:

For oil and coal, see para. 2—Fuel.

There are salt-pans at Laga and Tibar, where enough salt for the local market is obtained by solar evaporation. Manganese ore about 90% pure exists in the areas of Vemassee, Lautem, Nova Bemfica, Mt. Luilela and a district south of Baucau. There are sulphur springs in the upper reaches of the Marobo River. There are deposits of copper, gold, silver and iron.

5. Repair Facilities:

Repair facilities are very rare. A workshop was being constructed at Dilli Airdrome early in 1941. At Dilli there was an electric power house which has recently been removed to a place 325 yards (300 m.) east of the post office on the second road running parallel to the coast; this supplies electric power for the town and gives very poor service. At Beasso there was a cotton cleaning mill similar to the one at Debos. The power plant was a two-cylinder diesel motor, and there is a good supply of small hand tools.

6. Construction Materials:

Timber Supplies: Timber for bridge construction is limited, being confined to a few areas inaccessible through lack of roads. The best timbers are in the Fronteira Province and confined to the Fatu-Lufic, Tilomar, Maucatar and Mape areas. There being no roads whatsoever, transport would be a major problem and is, of course, the main reason why this good timber still stands. Iron bark, stringy bark and gum up to 6 feet (2 m.) in diameter, and up to 50 feet (16 m.) in length, are the maximum dimensions of these standing trees. In the past, timber has been hauled by natives for long distances by hitching about 200 "workers" to a long rope (or tarle) made from the sisal plant.

The Suro Province, Ermera, Railaco and Ramelau Ranges have suitable timbers for all classes of construction. Umboi, in the Ermera district, is a very handy source of supply. The timber in Lautem Province is mainly on the south coast, around the Silvicola area, where there is the only mill in Portuguese Timor.

Owing to relative scarcity and difficulty of transport, local resources are insufficient for normal military requirements. At present there are no stocks whatsoever on hand.

Poles: Only a limited supply of poles suitable for telephones are available.

Bamboo: Bamboo is the natives' universal constructional material. It is used as framing, including plates, studs, rafters, battens and flooring.

In the construction of huts, green bamboo is used as ties by splitting thin strands off the outside of the bamboo, no nails being necessary for these ties, properly made, make the construction rigid. Other native uses are for fences, beds, liquid containers, poles for carriers, scaffolding and small foot bridges across streams.

The life of bamboo is indefinite and its strength is amazing. There is an endless supply in all sizes up to 4 inches or 5 inches in diameter.

Thatching: There is an ample supply of thatching material throughout the island.

Metal, Gravel and Sand: On account of many rivers throughout the island, concrete material is plentiful and accessible.

Road Material: Limestone is usually handy for road repairs and also large limestone suitable for revetting, a prominent feature along the hilly roads.

SECTION XVI—POPULATION

1. European:

The European population is normally about 300 Portuguese, the majority of whom lived in the provincial capitals, particularly Dilli. The Portuguese are, in the main, government servants, administrators and Chefes de Posto. About fifty others are political deportados sent out from Portugal to Timor because of their political beliefs. They were, by design, evenly distributed through the seven provinces. They are generally allowed the freedom of the island, having to report to the local Chefe de Posto once a week. There is also a small proportion of Portuguese business men in the Sociedade (a commercial undertaking with large interests in coffee and rubber). There are only three Portuguese doctors in addition to some medical assistants. Many of the Portuguese are pro-Fascist, although very few are pro-Japanese.

The official policy of the Portuguese Government with the Allied Forces as adopted by the Portuguese Governor was absolute neutrality. During the period of peaceful Japanese penetration before their occupation of Timor, the Portuguese policy towards Japan was one of resistance. Similarly the majority of the Portuguese showed hostility to the Allied Forces when they occupied the capital in December, 1941. After the Japanese landing on 19th February, 1942, this attitude changed overnight.

2. Asiatic:

The Asiatic population is 2,000 Chinese, a few Japanese and some Arab traders in the coastal areas.

The Chinese are a very poor type, very few having any ties with China. The majority were born in Timor, and nearly all have a strain of native blood. They live to exploit the native, and would be ready at all times to support the more powerful side. They cannot be trusted. They carried out subversive activity and gave the Japanese much help; it is not clear to what extent their circumstances were responsible for this. They are commonly shopkeepers and tradesmen, and as such are widely distributed, but a considerable number live in the Chinese quarter of Dilli.

Despite earlier reports to the contrary, in January, '41, the Japanese population was only 13, comprising 9 men, 2 women and 2 children. Of the 9 men, 6 were connected with the Air Service and 3 with the Sociedade. It was not ascertained whether any of these Japanese were service or ex-service personnel, but neither the senior of the airways nor the commercial party appeared of a service type.

A certain Japanese civilian who used to travel around Timor making maps and gleaning information returned in 1942 as an infantry captain. On the night 19/20 February, '42, fifth columnists in the hills round Dilli guided the Japanese warships and transports by flashing lights.

The Arab traders of Mohammedan origin have drifted to the Timor ports from Sumatra. They are more prosperous merchants than the Chinese, and have large business ramifications and dwell in large white stone houses. Like the Chinese, they were found to be "pro-pataca." They were very efficient fifth columnists for the Japanese. It is difficult to estimate their number, but it is probably in the region of fifty, scattered mainly along the north coast.

3. Native (See Photos Nos. 58-63):

The native population is variously estimated at from 450,000 to 500,000. It is denser in the hills than along the north coast and the relatively unpopulated south coast.

An anthropologist has conjecturally described the native population as follows:—

a. "An earliest stratum of Papuan type, marked by relatively dark skin and woolly or frizzy hair. These are sometimes called the 'Asiatic Negroes.'

b. "A lower stratum of Indonesian type, with relatively pale skin, more European cast of features and wavy hair.

c. "A third and latest stratum of Malayan type. These are sometimes called the 'Asiatic Mongols.' They are characterised by Mongoloid facial features and relatively straight hair.

"These are fundamental racial types. The existent peoples reveal all degrees of mixture, though it is clear that the Papuan element predominates heavily. This is particularly so in the interior. The Malayan and Indonesian strains are mostly in evidence in the coastal regions."

An officer recently returned from Timor considers that there is very little Papuan stock in evidence, though there is a sprinkling of African Negro blood as a result of the influx of Mozambique native troops to quell the Great Rebellion of 1912.

The main tribal divisions are as follows:—

TRIBE	LANGUAGE	TRIBE	LANGUAGE
Lautem	Dagada	Viqueque	Macassai
Ocussi	Canalico	Liquissa	Tetum dialect
Bobonaro	Bunac and Quemaco	Manatuto	Laleia
Dilli	Tetum	Laclo	Galolo
Alas	Tetum	Maubara	Tucodedo
Fatu Berliu	Tetum	Ainaro	Mambai
Remexio	Tetum	Cailaco	Nogonago
		Atabai	Nogonago

Most of the tribes can speak and understand Tetum as well.

The Lautem people are darker than the others and are of better physique. They tend to keep to themselves and do not mix with the other tribes. Occasionally they intermarry with the people of Kisar. The people in a small village (name unknown) in the mountains of Laclo never intermarry. All the other tribes intermarry freely. They normally live in villages of at least ten huts. The majority of the natives are about 5 feet (1½ m.) in height and very well proportioned. Centuries of carrying loads on their heads through the mountains have given both men and women magnificent carriage and stamina. When unspoiled by the practice of chewing the betel-nut, their features are good and clearly defined.

Very few natives speak Malayan, the "lingua franca" throughout most of the N.E.I. It is only used by a few natives in the Dilli area, and is practically unknown in the interior. The medium between European and native in Dilli is mostly Portuguese, which has been taught in the Catholic schools; these schools also teach Tetum with a view to making it a universal language.

The vast bulk of the population live under conditions with which they seem well satisfied. The native will do a full day's work from sunrise to sunset on a very meagre ration of maize. They display a high degree of hardihood in facing the cold of the mountains practically without clothes. Their huts are thatched-roof buildings built up off the ground. Fires are kept burning inside their huts throughout the night, mainly to keep them warm. It is common to see from 6 to 12 natives living in the same house, which is comprised of one room built up in the roof, and it is used for both cooking and sleeping.

The Timor native is particular about his lepa (sarong); he is never seen without it and prefers gaudy colors. The man wears a lepa with a girdle, while the women wear, besides the sarong, an upper garment or tais (similar to a shawl) made from dyed native flax. Both sexes love adorning themselves with necklaces, charms, shells and coins.

Money, of which they have very little, is their god. Pay for a native is about 4 cents an hour. On the whole, they are very lazy and prefer

to gamble rather than work. Good use, however, can be made of them by our troops as carriers and runners.

There are some small communities of Christian (Catholic) convents and some Mohammedans at Dilli and scattered along the coasts. The influence of the priests and nuns in the mission areas of Soibada, Ainaro and Same is very great and has helped to keep the natives pro-Australian.

There are many different purely native religions. It may be of military and administrative importance to note two points (1) there are priests (dato luli) who wield considerable power, being sometimes identified with local chiefs, and (2) that Timor abounds with sacred places—mountains, rivers, trees, etc., as well as sacred houses (ume luli), which strangers are forbidden to approach. It is worth noting the reliance on taboo to preserve law and protect property.

"A prevalent custom is the pomali, exactly equivalent to the taboo of the Pacific Islanders and equally respected. It is used on the commonest occasions, and a few palm leaves stuck outside a garden as a sign of the pomali will preserve its produce from thieves as effectively as the threatening notice of man traps, spring guns or a savage dog would do with us."

A few natives trained in Portuguese schools at Dilli become clerks or telephone attendants, but their number is negligible. Some Christian converts receive some teaching from their Roman Catholic priests. The Chinese community support their own schools. The lack of an educational system is largely responsible for the inertia of the native population. The culture of the natives is confined to most expressive singing and dancing.

Probable Present Loyalties, and Attitude to Our Troops:

When the Australian and Dutch Forces landed in Portuguese Timor, the native attitude was one of intense curiosity, but after a few days' contact, they became exceedingly friendly, trying to converse with the Australian and Dutch troops, and offering the hospitality of the villages, even bringing livestock, fruit and other foodstuffs to our camping areas. Later, the natives found in our presence a chance to enrich themselves by bringing curios, such as knives, sarongs, monkeys and other articles for sale at ridiculously high prices. The natives never at any time actually showed fear.

After the Japanese landing at Dilli, the majority of the natives resident there immediately fled into the interior, and it was many months before the Japanese were able to approach them, as most continued to retreat before the Japanese advances.

Natives always showed willingness to help us. Some of the services performed by them are: Concealment of Allied troops from the enemy—transport—supplying of foodstuffs—the giving of information re enemy troop movements—personal services for the troops—acting as guides—carrying the wounded—the building of billets for the troops.

Unfortunately, after contact with the enemy, and after being impressed by his methods of force and propaganda, many natives readily changed sides to the benefit of the Japanese and to our detriment. However, it must be emphasised that natives are impressed by strong forces; the law of force is the law they understand. Although the majority have now swung over to the enemy, they would just as readily change sides again if strong Allied Forces landed in Timor.

SECTION XVII—ADMINISTRATION

1. Before Enemy Occupation:

The Colony of Portuguese Timor was administered by a Governor who was directly responsible to Portugal, and whose seat was at Dilli.

The Colony is divided into one "Concelho" or Council, with Dilli as capital and six circumscriçoes (conscriptions), each under the control of an Administrator. Omitting Ocussi, which is not being included in this study, and, for the sake of convenience, calling such an area a province, there are:—

Province	Native Name	Capital
		Portuguese Name
Dilli		Dilli (controls about 50,000 natives)
Fronteira	Bobonaro	Vila Armino Monteiro
Suro	Aileu	Vila General Carmona
Manatuto	Manatuto	Vila de Manatuto
Sao Domingos	Baucau	Vila Salazar
Lautem	Lautem	Vila Malaca

The term *Concelho* is applied to the province of Dilli in recognition of its superior status in that it has a city complying with certain qualifications. The administration of the province of Dilli is normally under the control of an Administrator who, in this instance, is the President of the Municipality, called *Camara Municipal* or Government Council. This body administers the municipality and has its own budget. Some member of the Council is named (by Government of Portugal, or failing this, the Governor himself) as *Lieut.-Governor*, and acts for the Governor if for any reason the latter is unable to act. The chain of responsibility for the administration of the conscriptions is through the Council of Dilli to the Governor.

Each province (conscription) is administered by an Administrator, who is a Portuguese and has his seat at the principal town of the province. A small body called the *Junta Local*, of which the Administrator is President, assists in the administration. The remaining two members are nominated or approved by the Administrator and the Governor, and where possible include a Doctor and a qualified native. It is the function of the *Junta* to stimulate native enterprises and to endeavour to market native produce through the Government Industrial Department at Dilli.

Each province is divided into between eight and twenty smaller administrative units called *postos*. Each *posto* is administered by a *Chefe de Posto* (C. de P.); the policy is to appoint a Portuguese, but where this is impossible a trustworthy native becomes an Auxiliary C. de P. Each C. de P. has his headquarters at the *Posto*, which is usually an elaborate fort-like building of white cement and built on a dominating feature. The *posto* area is divided into between three and twelve *sucos*, in charge of which there is a big native chief (*chefe boot*); up to this point all sub-divisions are territorial, but any further division is purely tribal. *Sucos* are divided into between two and fifteen villages (*povoações*), in charge of which are little native chiefs (*chefe kik* or *chefe de povoação*).

The *posto* police force consists of about ten selected natives called *muradors*, in charge of whom is a native corporal (*cabo*).

The divisions between the *postos* run across the ancient kingdom boundaries. Survivals of the ancient kingdom system are exemplified by a few *liurais* or native kings whom the Portuguese have found too powerful to be entirely relieved of their erstwhile power. These kings retain many privileges which are turned to advantage by the Portuguese, although the *chefe suco* is officially responsible to the C. de P. At the present time, with no Portuguese Government, the natives are reverting to their ancient kingdom ties. Many of the *postos* marked as such on the map have long been in disrepair.

The duties of the C. de P. make him a virtual dictator in his own area and include the collection of annual taxes. Each adult native must pay to the Government, which receives no financial aid from Portugal, 6 patacas (approximately 10/-) per annum. Adjudication by the C. de P., who holds court weekly, settles family disputes and all matters affecting discipline and administration. The Portuguese who control the work of the natives undoubtedly exercise strict control over them, and it would appear that the present system of administration has proved successful until the recent abnormal conditions.

Strict discipline is enforced, and for the slightest offence the natives are punished. This punishment takes the form of confinement to jail for long periods, in addition to large doses of "Palmitori." This consists of caning the palm of the hands with a heavy stick approximately 1 inch in diameter and about 18 inches in length, the top of which is shaped like a flat spoon pierced with a number of holes. It is so disliked that natives invariably prefer jail if offered a choice. Men, women and children alike receive punishment of this nature, and it is a common sight to see gangs of natives roped or chained together working on the rice fields or marching back to the calaboose at night. Wise C. de Ps., however, do not give palmitori to the chiefs, who have the real allegiance of the natives.

For six days of the week the natives are kept hard at work in the fields, plantations, roads or buildings; on the seventh, which may be any day of the week, all the natives in the *posto* area—men, women and children—flock to the *posto* for the bazaar. At the bazaar the natives spend their time bartering, chewing betel-nuts, yarning in squatting groups and, in the main, letting off steam and barracking in the cock-fights.

Patacas (Portuguese paper money specially for Timor) are the official currency. The nominal value of one pataca is about 1/8d. Australian money. The pataca has no exchange value outside the colony, because

Portuguese Timor has had no overseas trade. Dutch currency is no longer accepted by the natives, who value Australian silver highly. The Japanese introduced a note issue for the entire N.E.I. and Portuguese Timor based on the Dutch guilder. They also introduced "coins" having a cardboard centre and a thin coating of aluminium. Both natives and Australians treated these coins as worthless.

2. Probable Present Administration by the Enemy:

Japanese headquarters are situated at Dilli in the offices of the Asia Investment Company, which now has been partly destroyed. The Portuguese Governor tried to follow with the Japanese forces the same policy which he had successfully adopted with the Allied Forces—that of absolute neutrality. However, in the case of the Japanese, this involved him in innumerable difficulties, and he is unable to enforce his just neutral rights.

Portuguese administration has ceased to exist since August, 1942, when the Japanese propaganda stirred up the natives against all white races. Such Portuguese as are still on the island are refugees in the hills or virtual prisoners in a Japanese "neutrality zone." It may be assumed that the Japanese are pressing the natives into service, and are using the old Portuguese feudal system as the most efficient means of doing it.

SECTION XVIII—MEDICAL PROBLEMS

1. General:

The climate is tropical and oppressive, but seasonal; in the low-lying coastal strip the humidity has an enervating effect on troops. There is no marked temperature variation throughout the year, but a decided variation in humidity from season to season, and also from coastal to inland districts. In general, day and night temperatures near the coast are fairly constant, with small diurnal change. The dry season is least oppressive, while the intermonsoon months (April and November) are most trying because of absence of winds. Nights in the Maubisse area (Ramelau and Cablac mountains) are very cold.

In general, troops must practise careful personal hygiene, and in particular guard against diet deficiencies, tropical sores and ulcers, tinea and the effects of the sun and wet weather. Heavy manual labor is to be avoided; even Dutch soldiers, who are trained for warfare in similar regions, avoid excessive manual labor and use native laborers.

2. Diseases:

The following diseases are endemic: malaria, beri-beri, dysentery, tropical ulcers, intestinal parasitic infestations, tinea, goitre and elephantiasis.

Malaria is very common in the low-lying coastal areas, Dilli being one of the worst places; the higher altitudes are noticeably free from malaria. Maliana, however, is a bad area.

Three weeks after landing in Dilli, 90% of the Australian force contracted benign and malignant tertian malaria (the types peculiar to Portuguese Timor) because of three nights exposure to mosquitoes on the Dilli Airdrome. Under normal circumstances, the figure of sickness due to malaria was about 30%. The likelihood of contracting malaria in the coastal areas does not apparently vary with the time of year, but the cloudy humid weather is the worst. Free exposure to the sun, even when clothed, and fatigue produced by long patrols are, in some cases, common causes of recurrence of an attack.

Preventive measures consist of the use of quinine and mosquito nets; mosquito nets for the campaign had been provided before embarkation, but it was found impracticable to use them regularly, and troops were periodically without supplies of quinine because of loss of supplies and difficulty of communication. Towards the end of our campaign in Timor the use of quinine was accompanied by the bitter companions, atabrin and plasmaquin. The effect of malaria on the Australian force was to render a considerable number useless for climbing hills or fighting.

The attacks of malaria experienced by the natives are mild; they suffer periodically, and most children have malaria pot-bellies. They have certain medicines for malaria that are made from frangipanni and peach tree bark. It was noticeable that the creados, when given quinine, improved in health, with attacks much rarer.

The Portuguese inhabitants are just as likely to develop malaria as Europeans, and most have it latent in their blood.

A mild form of dysentery was prevalent at all times; it is considered to be mainly bacillary, and due to food as well as water. Investigation, after return to Australia, has revealed that amoebic dysentery does exist. The following precautions should be adopted for prevention of dysentery: Avoidance of uncooked greens, washing of all fruit, fly-proofing (generally impossible), boiling mess gear after use (native "creados" should not handle mess gear). There seemed to be no effective preventive; both Australian and native medicines were tried, and mist. bis. sed. and other drugs such as chlorodyne and tinc. cholorof et morph co. were commonly used. A prophylactic vaccine treatment (cholera, typhus and dysentery) obtained from the Dutch, as far as it is possible to judge, proved very effective. They recommend 3 doses of 1.0 c.c.s. each, given in at least weekly intervals, but supplies did not allow this to be done. The effect of dysentery on the natives was not noticeable, but it had a very weakening effect on Australian troops.

Other diseases include beri-beri, tropical ulcers, skin diseases, tinea and even leprosy. All these, except leprosy, are very prevalent among the natives; although a few lepers were seen among the natives, no Australian is known to have had it. Beri-beri was not observed among the Australians, but tropical ulcers, tinea and skin rashes were common. The smallest cut may quickly develop into a loathsome festering sore, which can grow rapidly from the size of a threepence to that of a soup plate. Even the greatest care (cleanliness, dressings, etc.) may not prevent the spreading of these sores, as the cause is largely unbalanced diet and low physical condition. "Barcoo rot" often broke out on the Australians through lack of proper food; rest and correct diet are the best preventives and cures.

Goitre (only observed in females) and elephantiasis are both peculiar to the natives, particularly those living in the mountains; Australians were never afflicted.

Portuguese Timor is reputed to be free from tetanus.

V.D. is very common among the natives; native quacks or medicine men have carefully guarded "cures." It seems that gonorrhea is commoner than syphilis among the women. Consequently, V.D. was fairly common among the troops, syphilis, however, being comparatively rare.

Troops must avoid eating under-cooked pork, all of which is infected with *Ascaris Lumbricoides* (human round worm). Native pigs eat human excreta. Otherwise, no disease experienced by our troops seems to be attributable to animals.

3. Insect Pests:

Insect pests to which the area is subject are as follows:—

a. *Anopheline Mosquitoes*: See para. 2 for malaria. There are apparently no dengue mosquitoes.

b. *Fleas*: As the natives allow their animals to wander freely and also share their native huts, fleas are very common. Fleas were commonly a nuisance to troops, particularly near native villages.

c. *Lice*: Head and body lice are common in all parts of the island. Troops were commonly infected by lice, which caused skin rashes and irritation. The only methods for delousing were very crude.

d. *Scorpions*: These are found all through the island, particularly near native villages. They have a painful, mildly poisonous sting which affects the nerves of the area of the bite.

e. *Centipedes*: These are common and have a bite even more painful and lasting than the scorpion's.

f. *Buffalo Fly*: These abound in all areas and worry the ponies considerably. They appear to have a disastrous effect on cattle. They do not, however, worry troops in any way.

g. *Common House Flies*: These are quite common, and many infections such as dysentery and skin sores may be partly due to this agency.

h. *Scabies* occurred in almost all areas occupied.

4. Dangerous Animals and Reptiles:

a. *Wild Buffalo*:

On the Nunura plains and along the southern coastal areas there are many wild buffaloes. A buffalo not with a herd should always be treated as dangerous, particularly if wounded. Even tame buffaloes sometimes attack white people, but rarely attack natives.

b. *Crocodiles*:

There are many crocodiles in the Be-Bai River and in the mouths of the southern rivers.

c. *Snakes:*

Snakes are common in the whole area, a venomous green species, commonest in the southern parts, predominating. These are about 2½ feet (almost 1 m.) long, with a cobra-like head. Cases of bites from the green snake treated relatively late showed considerable local oedema, but little toxæmia; no fatalities were observed. All other snakes seem to be non-venomous. The natives have an inherent fear of all snakes, and seem to consider them sacred.

Portuguese report that there are pythons in the Cailaco Range and the south coast areas.

d. *Animals:*

Other animals such as pigs, goats, deer, monkeys and rats are not dangerous to man.

e. *Birds:*

There are remarkably few birds.

SECTION XIX—CLIMATIC AND METEOROLOGICAL CONDITIONS

A—DILLI

(Compiled from Report by Director, R.A.A.F. Meteorological Services)

Note: In the absence of records of actual observations at Dilli, the information below is an estimation based on records from similarly located stations as close to Dilli as could be obtained. The result can be taken as a good approximation to the mean conditions there.

1. Rainfall:

a. *Rainfall (Seasonal):*

Wet (northwest) Season—December to March.

Dry (southeast) Season—May to October.

Intermediate Seasons—April, November.

Generally speaking, in the dry season most rain falls in the night, early morning particularly about 0600 hours; in other seasons from midday to 1600 hours.

In the wet season the average duration of rainfall is about 3 hours on each of 12 rain days per month, at an average rate of about .2 inches per hour. In the intermediate seasons only the duration is less, but in the dry season both intensity and duration are less.

b. *Estimated Monthly Rainfall—Dilli:*

RAINFALL (in inches)

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average	8	7	6	5	4	2	1	2	2	1	3	7	45
Maximum	20	18	15	13	13	8	6	4	1	3	13	18	80
Minimum	1	2	1	0	0	0	0	0	0	0	0	1	25
Av. No. of Rain Days	12	11	11	7	6	4	2	1	½	2	5	11	72

Greatest 24-hour fall—approx. 8 inches.

2. Winds:

a. *Seasonal Variations:*

The winds are seasonal, with land and sea breeze effects superimposed.

Wet season—December to March—northwest monsoons.

Dry season—May to October—southeast (trades).

Intermediate seasons—April and November—light and variable, chiefly land and sea breezes.

Because of local geographical influences, the lower winds prevailing in Dilli in the dry season are northeast.

b. *Velocity:*

The following table giving wind velocities for Koepang best illustrates the possible wind forces and their diurnal variation at Dilli:—

KOEPANG
Mean Wind Velocity in Miles Per Hour

Time	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
0700-1200	12	10	9	9	11	11	12	10	10	11	9	10	10
1200-1700	12	10	8	9	11	11	12	10	10	11	10	10	10
1700-0700	5	4	4	4	5	5	5	5	5	5	5	6	5
Daily Mean	8	7	6	6	7	8	8	7	7	7	7	7	7

c. *Sudden Storms and Squalls:*

Dilli is liable to be affected by gale force winds of tropical cyclones; these travel from East to West and usually south of Timor, so that Dilli experiences strong west winds. Overcast skies, heavy swell and steady rain are associated with the cyclones which occur almost without exception in April.

Heavy squalls are also associated with the continuous strong to gale force winds of a tropical cyclone; these may reach to 60 or 70 miles per hour (96 or 112 km. per hour).

Besides cyclones, rain squalls occur in the wet season; they are most likely to occur in the afternoon in association with cumulus and cumulonimbus clouds, they occur in all months of the wet season; in the most severe type, short gusts approach 60 miles per hour (96 km. per hour) and are accompanied by heavy rain, thunder and lightning. They usually last less than half an hour, but occur at intervals throughout the day.

3. **Cloud:**

Cloud formation is largely a seasonal phenomenon closely related to rainfall. The following figures for Koepang indicate the conditions which may be expected at Dilli:—

KOEPANG

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Cloud Amount in Tenths of Sky Cover	5	4	4	2	2	2	2	1	1	2	2	4

Skies are cloudier in the wet season than in the dry season. Convectional clouds are a feature of both seasons; they are most frequent over land by day and over sea by night.

4. **Fogs and Visibility:**

Fogs are probably rare, as there appears to be no marshes or swamps near Dilli. Fogs over the open sea are practically unknown.

From November to March visibility is usually good, but in periods of torrential rain the range of vision may be almost nil. During May and June large quantities of smoke and dust are carried over the Timor Sea and Timor from Northern Australia. This forms a haze which increases as the season continues, and from July to October a thick haze may persist in the atmosphere. The haze usually extends to about 7,000 feet, above which the air is very clear. This haze may reduce horizontal visibility to 6 miles (10 km.) or less, particularly in coastal areas in the early morning.

5. **Temperatures:**

There is a rather regular diurnal temperature variation, with maximum about 1400 hours and minimum about 0600 hours. The highest relative humidity occurs with lowest temperature and vice versa. In the dry season it is from 50% to 60% in the middle of the day, and from 80% to 90% at other times; in the wet season these ranges are from 70% to 80% and from 85% to 95% respectively.

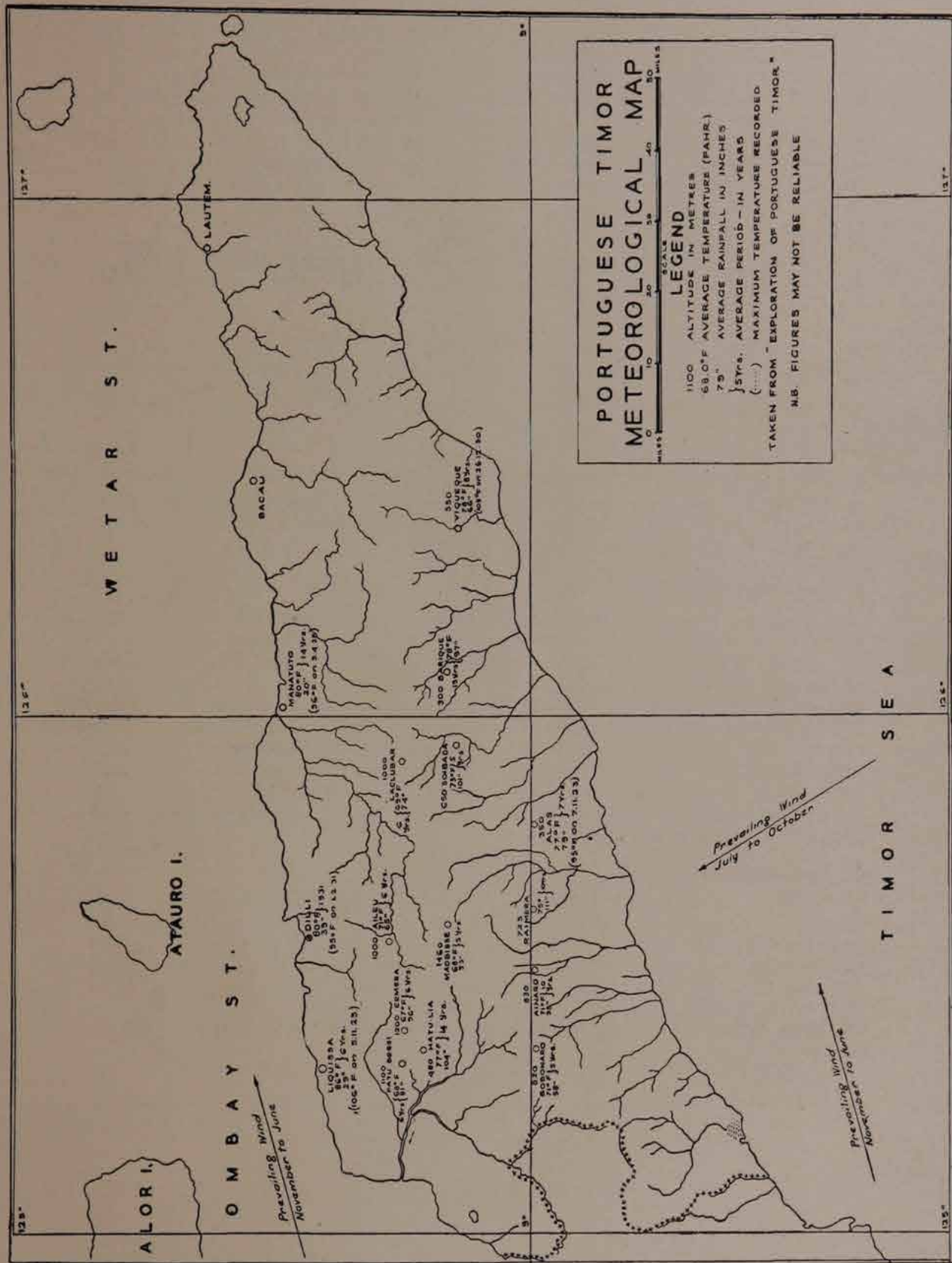
The following figures for Koepang should hold fairly well for Dilli:—

KOEPANG

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Mean Max. Temp. °F.	87	87	87	89	89	88	88	89	91	92	92	89	89
Mean Min. Temp. °F.	75	75	74	72	72	71	70	70	71	72	74	75	73
Abs. Max. Temp. °F.	95	94	96	97	96	94	95	98	99	101	101	98	101
Abs. Min. Temp. °F.	70	68	69	63	64	60	60	60	62	65	67	70	60
Mean Max. Rel. Humid.	97	97	97	96	94	93	93	91	89	92	94	95	94
Mean Min. Rel. Humid.	72	72	67	53	53	50	48	44	42	50	54	65	56

B—PORTUGUESE TIMOR IN GENERAL

Certain statistics of rainfall and temperature for fifteen stations over a period of from 5 to 14 years were published in "The Exploration of Portuguese Timor," with a warning that "the figures may not be reliable." They are reproduced in the Meteorological Map below.



1. Seasons and Rainfall:

There are two clearly defined seasons due to prevailing winds from the northwest and southeast: the former causes a general wet season in the December-March period and the latter causes the wet season in the area south of the central range to be prolonged to about July. The area can be divided into four climatic zones:—

North coast—hot dry—estimated rainfall range, 20"-45"
(mainly December to April). Mean Temp., 80° F.

South coast—hot moist—estimated rainfall range, 65"-110"
(mainly November to July). Mean Temp., 75° F.

Interior up to 4,000 feet (1,200 m.)—intermediate zone—estimated rainfall range, 55"-110" (mainly October to July). Mean Temp. under 70° F.

Interior above 4,000 feet (1,200 m.)—cold zone—estimated rainfall, 130", more evenly distributed. Mean Temp. relatively low.

The great bulk of the rain falls in the northwest season, which is characterised by violent rainstorms, floods and washaways. The driest part of the day is from 0600 to 1100 hours, the wettest from 1200 to 1900 hours.

2. Winds:

The dominant winds are northwest in the December-March period, southeast in the May-October period, with intermediate doldrum conditions and variable winds. The upper winds are probably consistent with this general movement, but the lower winds are light and influenced by land and sea breezes and local geography, and may appear to defy the regular rules. Thus, on the north coast the prevailing wind is from the sea, with August and September a period of variable winds. On the south coast the prevailing winds are offshore, except in October and November, when they are interrupted by southeast and variable winds.

3. Cloud:

Between sunrise and noon is clearest; afternoon the effects of insolation and uplifting build up thick cumulus clouds over land masses with consequent rainstorms in the wet season.

4. Temperatures:

No official records are available. Conditions outlined for Dilli are typical and may be taken as a guide. Estimated mean temperatures are: North Coast, 80° F.; South Coast, 75° F.; Interior up to 4,000 feet (1,200 m.), not over 70° F.; Interior over 4,000 feet (1,200 m) correspondingly lower. The south coast has a wider temperature variation than the north coast.

The northwest season, however, is definitely hotter than the southeast season. The highest maximum temperatures are about 100° F., with 107° F. the highest ever recorded.

5. Volcanic Activity:

Timor appears to lie outside the region of volcanic activity, but within the seismic area; earthquakes are frequent but slight.

SECTION XX—SOURCES & PERSONS WITH LOCAL KNOWLEDGE

This study has been prepared in co-operation with the Directorate of Intelligence, Allied Air Forces.

1. List of Sources:

Exploration of Portuguese Timor—Report of Allied Mining Corporation to Asia Investment Company Limited.
Report on Portuguese Timor by Department of Civil Aviation, Commonwealth of Australia.
Directorate of Intelligence, Allied Air Forces.
Military Intelligence and other files, LHQ.
Descriptive Report on Timor (28 Aug., '42)—Ia, LHQ.
Report from 2/2 Australian Independent Company, A.I.F.

2. Persons with Local Knowledge Interviewed:

a. *Service Personnel:*

Capt. D. Dexter, 2/2 Australian Independent Company, A.I.F., attached A.G.S.
Capt. J. Read, A.A.S.C., A.I.F., attached A.G.S.
Capt. D. Francis, A.A.S.C., A.I.F., attached A.G.S.
Sgt. J. F. Healey, 2/11 Field Company R.A.E., A.I.F., attached A.G.S.

Brigadier W. C. D. Veale, Commanding Officer, R.A.E. Training Centre, Wagga.

Lt.-Col. Spence, Commander of Forces in Timor, A.I.F.
Major Laidlaw, O.C., 2/2 Australian Independent Company, A.I.F.
Major Arnold, 23 Australian Brigade, A.I.F., now LHQ.
Capt. Dunkley, A.A.M.C., 2/2 Australian Independent Company, A.I.F.
Pay Lieut. F. J. A. Whittaker, R.A.N.V.R.
Lieut. Smythe, 2/2 Australian Independent Company, A.I.F.
Lieut. Dower, 2/4 Australian Independent Company, A.I.F.
Lieut. Doig, 2/2 Australian Independent Company, A.I.F.

b. *Civil Officials and Civilians:*

W/Cdr. D. Ross, R.A.A.F., Former British Consul, Dilli.
Mr. L. E. I. Brouwer (Companhia Ultramarina de Petrolis), now Acting Consul for Netherlands, Brisbane.

In addition, much valuable information was obtained from approximately 30 Europeans, former residents from all parts of the territory, and also from survey officers of the Shell Company.

APPENDIX "A"

TIMES OF SUNRISE AND SUNSET FOR 1943*

DILLI

Lat. 8° 30' S. Long. 126° 30' E.

Times shown as G.M.T.

SUNRISE				SUNSET			
Jan. 6 .. 2120	July 7 .. 2150	Jan. 6 .. 1000	July 7 .. 0926				
13 .. 2124	14 .. 2150	13 .. 1002	14 .. 0929				
20 .. 2128	21 .. 2151	20 .. 1004	21 .. 0930				
27 .. 2130	28 .. 2151	27 .. 1003	28 .. 0931				
Feb. 3 .. 2133	Aug. 4 .. 2148	Feb. 3 .. 1002	Aug. 4 .. 0931				
10 .. 2136	11 .. 2146	10 .. 1002	11 .. 0932				
17 .. 2137	18 .. 2143	17 .. 1000	18 .. 0932				
24 .. 2138	25 .. 2140	24 .. 0957	25 .. 0932				
Mar. 3 .. 2138	Sept. 1 .. 2136	Mar. 3 .. 0954	Sept. 1 .. 0931				
10 .. 2139	8 .. 2132	10 .. 0954	8 .. 0931				
17 .. 2139	15 .. 2129	17 .. 0950	15 .. 0931				
24 .. 2138	22 .. 2124	24 .. 0944	22 .. 0930				
31 .. 2137	29 .. 2120	31 .. 0939	29 .. 0930				
April 7 .. 2136	Oct. 6 .. 2117	April 7 .. 0935	Oct. 6 .. 0929				
14 .. 2137	13 .. 2113	14 .. 0931	13 .. 0929				
21 .. 2136	20 .. 2109	21 .. 0927	20 .. 0928				
28 .. 2137	27 .. 2107	28 .. 0925	27 .. 0930				
May 5 .. 2138	Nov. 3 .. 2105	May 5 .. 0923	Nov. 3 .. 0932				
12 .. 2139	10 .. 2104	12 .. 0921	10 .. 0933				
19 .. 2140	17 .. 2103	19 .. 0921	17 .. 0936				
26 .. 2141	24 .. 2103	26 .. 0920	24 .. 0938				
June 2 .. 2144	Dec. 1 .. 2105	June 2 .. 0920	Dec. 1 .. 0942				
9 .. 2145	8 .. 2106	9 .. 0919	8 .. 0945				
16 .. 2147	15 .. 2109	16 .. 0921	15 .. 0948				
23 .. 2148	22 .. 2112	23 .. 0923	22 .. 0953				
30 .. 2150	29 .. 2116	30 .. 0925	29 .. 0956				

*The maximum difference from the above table in the times of sunrise and sunset over the whole area of Portuguese Timor is + or - 2 mins.

TIMES OF MOONRISE FOR 1943*

DILLI

Lat. 8° 30' S. Long. 126° 30' E.

Times shown as G.M.T.

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1700	1822	1709	1857	1933	2052	2118	2222	2308	2313	—	0018
2	1750	1923	1808	1955	2025	2143	2207	2305	2348	2358	0028	0118
3	1843	2026	1910	2059	2116	2233	2254	2346	—	—	0126	0217
4	1941	2130	2010	2142	2208	2322	2340	—	0031	0047	0224	0314
5	2043	2231	2110	2235	2259	—	—	0027	0115	0139	0323	0408
6	2146	2329	2208	2326	2350	0011	0024	0107	0201	0234	0422	0502
7	2250	—	2303	—	—	0058	0105	0147	0251	0331	0519	0555
8	2312	0024	2355	0018	0040	0142	0146	0231	0343	0430	0613	0646
9	—	0118	—	0109	0129	0226	0227	0327	0440	0530	0707	0728
10	0050	0208	0048	0159	0216	0307	0309	0405	0539	0629	0801	0831
11	0145	0258	0138	0248	0303	0349	0352	0457	0640	0728	0854	0924
12	0247	0348	0229	0336	0347	0431	0437	0554	0742	0824	0947	1017
13	0327	0436	0318	0423	0430	0514	0524	0654	0843	0919	1041	1109
14	0416	0525	0408	0508	0512	0559	0615	0758	0942	1013	1135	1158
15	0504	0614	0456	0552	0555	0646	0711	0901	1039	1107	1227	1245
16	0553	0701	0544	0635	0638	0736	0812	1003	1134	1200	1317	1330
17	0641	0748	0629	0718	0722	0831	0915	1103	1227	1253	1405	1412
18	0730	0834	0713	0801	0809	0931	1018	1200	1320	1345	1451	1453
19	0818	0918	0758	0845	0858	1032	1121	1255	1413	1437	1535	1534
20	0905	1002	0840	0931	0951	1135	1221	1348	1505	1525	1616	1614
21	0952	1044	0925	1019	1048	1237	1318	1440	1555	1612	1657	1655
22	1047	1127	1007	1109	1147	1337	1412	1531	1644	1657	1738	1737
23	1121	1214	1052	1202	1248	1434	1505	1621	1732	1739	1819	1823
24	1203	1253	1137	1258	1348	1527	1555	1711	1817	1821	1902	1912
25	1246	1339	1226	1356	1447	1619	1646	1800	1901	1902	1947	2005
26	1329	1427	1315	1455	1543	1709	1736	1849	1943	1943	2034	2102
27	1411	1517	1407	1554	1637	1759	1825	1935	2024	2025	2125	2202
28	1455	1612	1503	1655	1730	1848	1915	2020	2106	2109	2220	2304
29	1542	—	1601	1747	1822	1939	2004	2104	2147	2154	2317	—
30	1632	—	1700	1845	1911	2029	2052	2145	2230	2243	—	0007
31	1725	—	1759	—	2002	—	2138	2227	—	2334	—	0107

TIMES OF MOONSET FOR 1943*

Times shown as G.M.T.

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0443	0617	0505	0645	0710	0809	0826	0936	1039	1058	1228	1314
2	0536	0718	0605	0738	0756	0855	0914	1023	1127	1148	1325	1410
3	0632	0820	0703	0827	0842	0941	1002	1108	1214	1241	1423	1503
4	0744	0919	0801	0915	0927	1029	1050	1156	1302	1335	1520	1553
5	0847	1018	0856	1002	1013	1118	1139	1242	1354	1432	1613	1641
6	0940	1112	0948	1048	1100	1207	1224	1338	1444	1530	1705	1727
7	1042	1203	1038	1134	1148	1255	1312	1428	1541	1628	1754	1813
8	1140	1251	1126	1221	1236	1343	1359	1505	1637	1723	1842	1859
9	1236	1337	1212	1308	1324	1430	1445	1557	1737	1818	1930	1945
10	1327	1422	1259	1356	1412	1517	1532	1652	1835	1911	2017	2033
11	1414	1507	1344	1445	1500	1603	1621	1750	1933	2000	2104	2123
12	1459	1551	1430	1532	1548	1650	1712	1851	2029	2049	2150	2213
13	1543	1637	1517	1620	1636	1738	1806	1952	2122	2138	2243	2303
14	1627	1722	1604	1709	1723	1832	1904	2052	2213	2226	2332	2353
15	1710	1808	1652	1757	1812	1925	2006	2150	2302	2315	—	—
16	1754	1856	1740	1845	1901	2024	2109	2245	2350	—	0022	0043
17	1840	1946	1828	1933	1953	2124	2212	2338	—	0003	0112	0131
18	1926	2034	1916	2022	2047	2227	2313	—	0038	0052	0201	0215
19	2014	2121	2004	2113	2144	2330	—	0027	0126	0142	0250	0303
20	2102	2211	2053	2205	2243	—	0008	0114	0214	0231	0337	0347
21	2150	2258	2141	2259	2344	0031	0103	0201	0302	0320	0423	0434
22	2238	2345	2231	2359	—	0127	0140	0248	0350	0409	0508	0521
23	2326	—	2322	—	0042	0219	0236	0334	0439	0457	0554	0611
24	—	0035	—	0055	0142	0306	0311	0420	0528	0544	0642	0701
25	0014	0125	0012	0154	0238	0355	0406	0508	0616	0631	0732	0758
26	0101	0217	0107	0252	0330	0439	0450	0556	0703	0718	0824	0859
27	0148	0313	0158	0349	0421	0522	0546	0644	0750	0805	0918	1002
28	0237	0407	0259	0441	0507	0607	0623	0732	0837	0853	1016	1103
29	0328	—	0359	0533	0554	0651	0710	0820	0923	0944	1116	1202
30	0423	—	0455	0623	0638	0738	0758	0907	1011	1036	1207	1259
31	0519	—	0551	—	0722	—	0846	0955	—	1131	—	1349

*Times of moonrise and moonset will be 4 mins. earlier at the northeastern extremity and 5-7 minutes later at the southwestern extremity.

APPENDIX "B"

PRONUNCIATION OF PORTUGUESE NAMES

Many of the important places in Portuguese Timor have been given a new Portuguese name, of some patriotic figure or other. The system has led to a great deal of duplication and some misunderstanding. It is still customary on the island, however, to use the original native name, and this habit persists even amongst many of the Portuguese, the new name being used practically only in their official dealings. Sparrow Force has always used the native names, and it is highly desirable that these names should be used for all maps, studies and reports. The new Portuguese name could be added in parenthesis, as desired.

The spelling of the native names has led to much confusion. In accordance with the general principle of using local names and spellings, the Portuguese phonetic system will be followed here. This system is at least regular, and although it may cause a little trouble at first, it is quite simple. English spelling forms follow no phonetic system and are consequently impossible to use for the purpose.

Rules:

1. Vowels are pronounced roughly, as in French:—

"a" is pronounced "AH"
"e" is pronounced "EH"
"i" is pronounced "EE"
"ai" is pronounced "I"
"o" is pronounced "O" (short)
"o" (with accent) is pronounced "OH"
"u" is pronounced "OO"
"au" or "ao" is pronounced "OW" as in "HOW"

*A wavy line over a letter means it is pronounced nasal.

2. Every letter should be pronounced independently without slurring.
3. The final syllable is often scarcely sounded, so that it is difficult to hear if there is a final consonant.
4. Several consonants have rather different values in Portuguese.

"C" is pronounced "K" unless there is a cedilla, then as "S."
"K" does not exist.
"QUE" is pronounced "KEH."
"S" is pronounced "SH."
"SS" is pronounced "S."
"W" does not exist; use "U."
"X" is pronounced "SH."
"Y" does not exist; use "I."

Examples:

1. AILEU, pronounced "I-LAY-OO."
2. BECO, pronounced "BAY-KO."
3. BEASSO or BEACO, pronounced "BAY-ASSO."
4. LIQUISSA or LIQUICA, pronounced "LIK-ISSA."
5. LETE-FOHO, pronounced "LET-FO" (final syllable soft).
6. MAUBISSE, pronounced "MOW-BISS-EH."
7. SAME, pronounced "SAH-MEH."

There are a number of very usual geographical names which repeatedly occur in the map, and some may be noted here. Consonants are varied in different localities;—

FATU, BATU, HATU, UATO—White rocky crag.
LOLO—Mountain.
FOHO—Mountain.
TATA, MATA—Mountain.
MOTA—River.
UE, VE, VEI, BE—River, water.
RAI—Land.
LULIC—Ghost, fetish, taboo.
CUAC—Cave.

*It has not been possible to print this symbol in text. It should appear over 'a' in "Sao," 'a' in "Subao," final 'a' in "povoação," 'o' in "circumscrições," and final 'o' in "povoações."

APPENDIX "C"

GAZETTEER OF TOWNS AND VILLAGES IN PORTUGUESE TIMOR

Place Names and Alternate Names	Description	Province	Reference	
ABLAI-FU	Village	Suro	8° 59' S.,	125° 34' 30" E.
AFAGABA	Trig.	Sao Domingos	8° 32' 48" S.,	126° 38' 10" E.
AFILICAI-BAGUIA	Village	Sao Domingos	8° 40' 20" S.,	126° 34' E.
AFILICAI-LECA	Village	Sao Domingos	8° 44' S.,	126° 34' 20" E.
AILEU	Capital	Suro	8° 43' 48" S.,	125° 34' E.
(Vila General Carmona)	Posto Town			
AINARO (Vila de Ainaro)	Posto Town	Suro	9° 00' 02" S.,	125° 31' E.
APELO	Posto Town	Dilli	8° 34' 30" S.,	125° 23' E.
AI-FU	Village	Suro	8° 44' 48" S.,	125° 21' 48" E.
AILALEC	Village	Manatuto	8° 53' 11" S.,	125° 46' 48" E.
AILIRES	Village	Manatuto	8° 56' 10" S.,	126° 07' 20" E.
AITANA	Trig.	Manatuto	8° 44' 48" S.,	126° 07' 46" E.
AI-TUTO	Village	Sao Domingos	8° 50' S.,	126° 27' E.
AITUTO	Village	Suro	8° 53' S.,	125° 36' 50" E.
ALAS	Posto Town	Suro	9° 00' 48" S.,	125° 48' E.
ALGES, NOVA (See Tibar)	Posto Town	Dilli	8° 34' 20" S.,	125° 29' 20" E.
ALIAMBATA	Village	Sao Domingos	8° 48' S.,	126° 35' 30" E.
ANADIA, NOVA (See Fatu-Berliu)	Posto Town	Manatuto	8° 57' S.,	125° 52' 48" E.
ANCORA, NOVA (See Laival)	Posto Town	Lautem	8° 25' S.,	126° 44' 11" E.
ARCOS (See Cassa)	Township	Suro	9° 03' 48" S.,	125° 29' 40" E.
ARMINDO, VILA . . . MONTEIRO (See Bobonaro)	Posto Town	Fronteira	9° 01' 11" S.,	125° 21' 11" E.
ATABAI (Atalaia)	Township	Fronteira	8° 48' S.,	125° 11' 06" E.
ATAHA	Village	Manatuto	8° 41' 20" S.,	126° 02' E.
ATSABE (Nova Ourem)	Posto Town	Fronteira	8° 55' S.,	125° 24' 11" E.
ATURA	Village	Suro	8° 49' S.,	125° 25' 48" E.
AUCANDOC	Village	Suro	9° 08' 11" S.,	125° 48' 05" E.
AURANA	Village	Manatuto	8° 51' 50" S.,	125° 45' E.
AVIS, VILA DE (See Fuiloro)	Posto Town	Lautem	8° 27' S.,	127° 00' 11" E.
BAGUIA	Township	Sao Domingos	8° 38' S.,	126° 39' 13" E.
BAHA-TERLDO	Village	Sao Domingos	8° 36' S.,	126° 19' E.
BALIAMORI	Village	Sao Domingos	8° 33' 10" S.,	126° 16' 08" E.
BALIBO	Posto Town	Fronteira	8° 58' 20" S.,	125° 02' 20" E.
BANTURO	Village	Dilli	8° 40' S.,	125° 20' E.
BARIQUE	Posto Town	Manatuto	8° 50' 45" S.,	126° 04' 48" E.
BARLIU	Village	Lautem	8° 26' S.,	126° 46' 30" E.
BATUGADE (Caxias de Extremo)	Township	Fronteira	8° 57' S.,	124° 58' 20" E.
BATU	Township	Fronteira	8° 56' S.,	125° 22' 48" E.
BAUCAU	Capital	Sao Domingos	8° 28' S.,	126° 27' 01" E.
(Vila Salazar)	Posto Town			
BAZAR-TETE	Posto Town	Dilli	8° 39' 01" S.,	125° 23' 20" E.
(Vila Eduardo Marques)				
BEASSO (or BEACO)	Township	Sao Domingos	8° 56' 14" S.,	126° 26' 06" E.
BE-BAU	Village	Fronteira	8° 50' S.,	125° 03' E.
BECCO	Township	Fronteira	9° 14' 45" S.,	125° 25' 08" E.
BELAS (See Ossu)	Posto Town	Sao Domingos	8° 45' S.,	126° 22' 11" E.
BELICASSE	Village	Sao Domingos	8° 34' S.,	126° 41' 02" E.
BE MOTIN	Village	Fronteira	9° 01' S.,	125° 05' E.
BE-NARUCO	Village	Sao Domingos	8° 49' S.,	126° 22' 14" E.
BERE-COLE	Village	Sao Domingos	8° 34' 14" S.,	126° 23' E.
BERENEZ-CACOTO	Village	Fronteira	9° 02' S.,	124° 56' 13" E.
BERU	Village	Lautem	8° 28' S.,	127° 14' 08" E.
BESUSU	Village	Suro	9° 06' 30" S.,	125° 53' E.
BETANO (See Nutur)	Village	Suro	9° 09' 48" S.,	125° 42' 48" E.
BIBILEU	Village	Sao Domingos	8° 51' 20" S.,	126° 16' 06" E.
BIBILUTO	Village	Sao Domingos	8° 56' S.,	126° 24' E.
BIDUCU	Village	Dilli	8° 34' 48" S.,	125° 31' 14" E.
BOA VISTA (See Calicai)	Posto Town	Sao Domingos	8° 34' S.,	126° 36' E.
BOBONARO	Capital	Fronteira	9° 01' 11" S.,	125° 21' 11" E.
(Vila Arlindo Monteiro)	Posto Town			
BOBOREMA	Village	Suro	8° 53' S.,	125° 22' E.
BOHILI	Village	Suro	8° 52' 10" S.,	125° 19' 10" E.
BOIBAO	Village	Dilli	8° 40' 10" S.,	125° 19' 30" E.
BUALEU	Village	Lautem	8° 36' S.,	127° 05' E.
BUBUSUSU	Village	Manatuto	8° 54' 14" S.,	125° 46' 20" E.
BUILO	Trig.	Sao Domingos	8° 46' S.,	126° 28' E.
CAI-CASSA	Village	Manatuto	8° 55' S.,	125° 49' 11" E.
CAI-BUTI	Village	Sao Domingos	8° 44' 10" S.,	126° 25' 14" E.
CAILACO	Posto Town	Fronteira	8° 54' 48" S.,	125° 17' 11" E.
CAILORA	Village	Suro	8° 56' S.,	125° 35' E.
CAI-MAUC (Nova Portel)	Township	Manatuto	8° 40' 20" S.,	125° 47' 20" E.
CAIRABELA	Village	Sao Domingos	8° 29' 48" S.,	126° 19' E.
CAITABA	Trig.	Suro	9° 08' S.,	125° 45' E.
CALICAI (Boa Vista)	Posto Town	Sao Domingos	8° 34' S.,	126° 36' E.
CAMARA, VILA FILAMENO DA (or Same)	Posto Town	Suro	9° 00' S.,	125° 40' 20" E.
CAMINHA, NOVA (Fatu-Maquere)	Township	Manatuto	8° 46' 48" S.,	125° 47' 14" E.
CARABAU-LAU	Village	Suro	8° 57' 05" S.,	125° 39' E.
CARMONA, VILA GENERAL . . . (See Aileu)	Capital	Suro	8° 43' 40" S.,	125° 34' E.
CASSA (Arcos)	Posto Town			
CATCHO	Township	Suro	9° 03' 48" S.,	125° 29' 48" E.
CATCHO	Village	Manatuto	8° 29' 11" S.,	125° 56' E.
CAXIAS da EXTREMO (See Batugade)	Township	Fronteira	8° 57' S.,	124° 58' 20" E.

Gazetteer of Towns and Villages in Portuguese Timor—Continued

Place Names and Alternate Names	Description	Province	Reference	
CELESTINO, VILA DA SILVA (See Hatu-Lia)	Posto Town	Suro	8° 48' S.,	125° 21' 20" E.
CLACOC (See Quicoras or Kioras)	Village	Manatuto	9° 02' 48" S.,	126° 01' 48" E.
CLEDEC	Village	Manatuto	8° 59' 06" S.,	125° 54' 09" E.
COLI-BAHAHA	Village	Suro	8° 42' S.,	125° 45' 14" E.
COM (Nova Nazare)	Township	Lautem	8° 22' S.,	127° 03' 06" E.
COMORO	Village	Dilli	8° 36' 11" S.,	125° 31' 20" E.
COVA	Village	Fronteira	9° 03' 48" S.,	125° 00' 05" E.
CRIBAS	Township	Manatuto	8° 41' S.,	125° 59' 06" E.
CUMNASSA	Village	Fronteira	9° 18' 48" S.,	125° 18' E.
DACOLA	Township	Fronteira	9° 19' S.,	125° 03' 05" E.
DARA-BAI	Village	Sao Domingos	8° 49' 48" S.,	126° 32' E.
DAI-NAME (See Saenamo)	Village	Lautem	8° 40' 48" S.,	126° 59' E.
DEBOS	Township	Fronteira	9° 19' 10" S.,	125° 16' 05" E.
DIAA-TUTO	Trig.	Manatuto	8° 48' 45" S.,	125° 52' 30" E.
DILLI	Posto Town (Capital)	Dilli	8° 33' 45" S.,	125° 34' 14" E.
DU-CRAI	Village	Suro	8° 47' 48" S.,	125° 28' 45" E.
DUHORHOR	Village	Suro	8° 49' S.,	125° 25' E.
EDUARDO, VILA MARQUES (See Bazar-Tete)	Posto Town	Dilli	8° 39' S.,	125° 23' 20" E.
ELOMAR	Township	Lautem	8° 45' S.,	126° 46' 11" E.
EMERA, VILA DE (See Ermera)	Posto Town	Suro	8° 46' S.,	125° 23' 14" E.
FAI-NIA	Village	Suro	8° 54' 48" S.,	125° 45' E.
FAI RIN	Village	Manatuto	8° 56' 11" S.,	126° 00' 05" E.
FATU-BERLIU (Nova Anadia)	Posto Town	Manatuto	8° 57' S.,	125° 52' 48" E.
FATU-BESSI (See Cota Bot)	Village	Fronteira	9° 01' S.,	124° 58' 08" E.
FATU-BESSI	Township	Suro	8° 45' 14" S.,	125° 19' 11" E.
FATU-CUAC	Township	Suro	9° 07' 48" S.,	125° 46' E.
FATU-CHILI	Village	Manatuto	8° 36' 10" S.,	126° 09' 06" E.
FATU-LULIC (Nova Monchique)	Posto Town	Fronteira	9° 12' 48" S.,	125° 08' 20" E.
FATU-MAQUEREC (Nova Caminha)	Township	Manatuto	8° 46' 48" S.,	125° 47' 14" E.
FATU-MEAN (Oliveira)	Posto Town	Fronteira	9° 14' 11" S.,	125° 01' E.
FATU-MALAI	Village	Manatuto	8° 30' S.,	125° 51' 11" E.
FATU-MACA	Village	Sao Domingos	8° 30' 06" S.,	126° 26' E.
FATU-LARAN	Village	Fronteira	8° 49' 45" S.,	125° 09' 11" E.
FATU-RO	Village	Lautem	8° 24' S.,	127° 01' 48" E.
FATU-ULUM	Village	Manatuto	8° 47' 11" S.,	125° 58' E.
FILAMENO, VILA DA CAMARA (See Same)	Posto Town	Suro	9° 00' S.,	125° 40' 20" E.
FUILORO (Vila de Avis)	Posto Town	Lautem	8° 27' S.,	127° 00' 10" E.
FOHO-REM (Nova Gouveia)	Posto Town	Fronteira	9° 17' 48" S.,	125° 06' E.
FOHO-TUM	Village	Manatuto	8° 49' 48" S.,	125° 46' 30" E.
GENERAL, VILA CARMONA (See Aileu)	Posto Town	Suro	8° 43' 48" S.,	125° 34' E.
GOUVEIA, NOVA (See Foho-Rem)	Posto Town	Fronteira	9° 17' 48" S.,	125° 06' E.
GUGULEU	Village	Dilli	8° 41' S.,	125° 10' 30" E.
GULOLO	Village	Fronteira	8° 55' 11" S.,	125° 20' 48" E.
GUTY-LAU	Village	Dilli	8° 38' 48" S.,	125° 22' 20" E.
HATU-ARIANA	Trig.	Sao Domingos	8° 38' 11" S.,	126° 24' 20" E.
HATU-BUILICO (Viriata)	Township	Suro	8° 54' 20" S.,	125° 31' 30" E.
HATU-DONA	Village	Sao Domingos	8° 33' 20" S.,	126° 18' E.
HATU-LIA (Vila Celestino da Silva)	Posto Town	Suro	8° 48' S.,	125° 21' 20" E.
HATU-UDO (Nova Luca)	Posto Town	Suro	9° 07' 06" S.,	125° 35' 20" E.
HAU	Village	Manatuto	8° 29' 11" S.,	125° 53' E.
HAU-BOCO	Village	Sao Domingos	8° 33' 06" S.,	126° 15' 48" E.
HENOC (or Henock)	Trig.	Manatuto	8° 45' S.,	125° 59' E.
HERA	Township	Dilli	8° 32' 10" S.,	125° 41' E.
HOME	Village	Lautem	8° 28' 11" S.,	126° 57' 48" E.
HUI-AU	Village	Manatuto	8° 30' 11" S.,	125° 59' 06" E.
ILIOMAR	Posto Town	Lautem	8° 43' S.,	126° 49' 06" E.
IRA-UMA	Village	Lautem	8° 21' 11" S.,	126° 56' E.
JOAN	Village	Lautem	8° 21' 48" S.,	127° 12' 14" E.
LACLO	Posto Town	Manatuto	8° 33' 20" S.,	125° 55' 11" E.
LACLUBAR (Vila de Ouriques)	Posto Town	Manatuto	8° 45' 14" S.,	125° 54' 08" E.
LACLUTA	Posto Town	Manatuto	8° 47' 10" S.,	126° 08' 14" E.
LACLUBAI	Village	Sao Domingos	8° 53' 11" S.,	126° 17' 48" E.
LADIC	Village	Suro	8° 59' S.,	125° 37' E.
LAGA	Posto Town	Sao Domingos	8° 29' S.,	126° 36' E.
LAHAMEA	Village	Fronteira	9° 01' S.,	125° 15' 14" E.
LAHANE	Village	Dilli	8° 34' 48" S.,	125° 34' 11" E.
LAIVAI (Nova Ancora)	Posto Town	Lautem	8° 25' 05" S.,	126° 44' 11" E.
LALEIA	Posto Town	Manatuto	8° 32' S.,	126° 10' 20" E.
LALENO	Trig.	Lautem	8° 28' S.,	126° 53' 30" E.
LAMSANA	Village	Manatuto	8° 32' 20" S.,	126° 04' 30" E.
LAU-BUDO	Village	Suro	8° 41' S.,	125° 30' E.
LAU-LORA	Posto Town	Dilli	8° 35' 11" S.,	125° 33' 10" E.

Gazetteer of Towns and Villages in Portuguese Timor—Continued

Place Names and Alternate Names	Description	Province	Reference
LAUTEM (Vila Nova Malaca)	Posto Town (Capital)	Lautem	8° 22' 14" S., 126° 54' 30" E.
LAU-VAI	Village	Dilli	8° 40' S., 125° 09' 11" E.
LAVATERE	Trig.	Lautem	8° 32' 14" S., 126° 41' 09" E.
LEBOS	Posto	Fronteira	9° 09' 50" S., 125° 13' E.
LECA (See Uato-Lari)	Posto Town	Sao Domingos	8° 46' 14" S., 126° 34' 05" E.
LEGUMAU	Trig.	Lautem	8° 33' 48" S., 126° 47' E.
LESSA-LULIC		Fronteira	8° 54' 09" S., 125° 16' 30" E.
LESSO-ALI	Village	Suro	8° 56' 05" S., 125° 37' 30" E.
LETE-FOHO (Nova Obidos)	Posto Town	Suro	8° 50' S., 125° 25' 30" E.
LEQUIHAMA	Village	Suro	8° 52' 09" S., 125° 20' 11" E.
LEQUI-LEVATO	Trig.	Sao Domingos	8° 30' S., 126° 22' E.
LIAS	Village	Suro	9° 09' S., 125° 33' 10" E.
LILTAI	Village	Suro	8° 40' S., 125° 40' 10" E.
LIQUISSA (Vila de Liquica)	Posto Town	Dilli	8° 35' 48" S., 125° 19' 11" E.
LIU	Village	Suro	8° 41' S., 125° 25' E.
LOHOBETUN	Village	Fronteira	9° 11' S., 125° 01' 20" E.
LOITAFI	Village	Sao Domingos	8° 42' 45" S., 126° 36' E.
LOI-UNO	Village	Sao Domingos	8° 47' S., 126° 22' E.
LOLOTOI	Posto Town	Fronteira	9° 09' 48" S., 125° 18' 14" E.
LOS PALA	Village	Lautem	8° 30' 48" S., 126° 59' 10" E.
LORE	Posto Town	Lautem	8° 39' S., 127° 01' E.
LU-CAI-NETA	Village	Sao Domingos	8° 45' 14" S., 126° 25' E.
LUCA-LALI	Village	Sao Domingos	8° 51' 14" S., 126° 30' E.
LURO	Township	Lautem	8° 32' 20" S., 126° 51' E.
MACU-LICO	Village	Sao Domingos	8° 52' 11" S., 126° 28' E.
MALIANA	Township	Fronteira	9° 00' 05" S., 125° 14' 20" E.
MALACA, VILA NOVA (See Lautem)	Posto Town	Lautem	8° 22' 14" S., 126° 54' 30" E.
MANAI	Village	Fronteira	9° 23' 48" S., 125° 05' E.
MANATUTO, VILA DE	Posto Town (Capital)	Manatuto	8° 31' S., 126° 01' 30" E.
MANUFAI	Village	Suro	9° 05' 10" S., 125° 48' 10" E.
MAPE	Posto Town	Fronteira	9° 04' 10" S., 125° 25' 06" E.
MAROBO	Township	Fronteira	8° 58' 48" S., 125° 21' 14" E.
MARQUES, VILA EDUARDO (See Bazar-Tete)	Posto Town	Dilli	8° 39' S., 125° 23' 20" E.
MATATA	Village	Dilli	8° 41' 20" S., 125° 23' 30" E.
MATA-BIA	Trig.	Sao Domingos	8° 38' 48" S., 126° 35' 07" E.
MAUBARA	Posto Town	Dilli	8° 37' S., 125° 11' 06" E.
MAUBISSE	Posto Town	Suro	8° 50' 48" S., 125° 36' 20" E.
MAU-BESSI (See Mindelo)	Posto Town	Suro	8° 53' 48" S., 125° 42' E.
MAUBERE	Village	Manatuto	8° 51' S., 125° 42' E.
MAUCATAR	Posto Town	Fronteira	9° 14' 06" S., 125° 13' 06" E.
MAU-ANA	Village	Manatuto	8° 51' S., 125° 42' E.
MEMO	Township	Fronteira	9° 02' S., 125° 11' 10" E.
MENAPA	Village	Fronteira	8° 56' S., 125° 15' 10" E.
META-HAU	Village	Sao Domingos	8° 48' S., 126° 35' E.
MINDELO (Mau-Bessi)	Posto Town	Suro	8° 53' 48" S., 125° 42' E.
METI-NARO	Village	Manatuto	8° 31' 10" S., 125° 45' E.
MONCHIQUE, NOVA (See Fatu-Lulic)	Posto Town	Fronteira	9° 12' 48" S., 125° 08' 14" E.
MONTEIRO, VILA ARMINDO (See Bobonaro)	Posto Town	Fronteira	9° 01' 11" S., 125° 21' 14" E.
MONTASSI	Village	Suro	8° 59' S., 125° 32' E.
MORAI	Village	Dilli	8° 38' S., 125° 10' E.
MOSEGA	Village	Suro	8° 56' 11" S., 125° 36' E.
MUA-PITINE	Village	Lautem	8° 31' 30" S., 127° 06' E.
MUNDO PERDIDO	Trig.	Sao Domingos	8° 43' 14" S., 126° 19' 30" E.
NASUTA	Village	Dilli	8° 38' 14" S., 125° 26' 48" E.
NATARBORA	Village	Manatuto	8° 59' 20" S., 126° 04' 14" E.
NOVA ALGES (See Tibar)	Posto Town	Dilli	8° 34' 20" S., 125° 29' 30" E.
NOVA ANADIA (See Fatu-Berliu)	Posto Town	Manatuto	8° 57' S., 125° 52' 08" E.
NOVA ANCORA (See Laival)	Posto Town	Lautem	8° 25' S., 126° 44' 11" E.
NOVA BEMFICA (See Uato-Carabau)	Posto Town	Lautem	8° 42' S., 126° 41' 10" E.
NOVA CAMINHA (See Fatu-Maquerec)	Township	Manatuto	8° 46' 48" S., 125° 47' 20" E.
NOVA GOUVEIA (See Foho-Rem)	Posto Town	Fronteira	9° 17' 48" S., 125° 06' E.
NOVA LUCA (See Hatu-Udo)	Posto Town	Suro	9° 07' 48" S., 125° 35' 20" E.
NOVA MONCHIQUE (See Fatu-Lulic)	Posto Town	Fronteira	9° 12' 48" S., 125° 08' 20" E.
NOVA NAZARE (See Com)	Township	Lautem	8° 22' S., 127° 03' 08" E.
NOVA OBIDOS (See Lete-Foho)	Posto Town	Suro	8° 50' S., 125° 25' 14" E.
NOVA OUREM (See Atsabe)	Posto Town	Fronteira	8° 55' S., 125° 24' 14" E.
NOVA PORTAL (See Cai-Mauc)	Township	Manatuto	8° 40' 20" S., 125° 47' 20" E.
NOVA SAGRES (See Tutuala)	Posto Town	Lautem	8° 23' 07" S., 127° 15' 11" E.
NOVA, VILA MALACA (See Lautem)	Posto Town	Lautem	8° 22' 20" S., 126° 54' 02" E.
NUNURA	Township	Fronteira	8° 58' 20" S., 125° 06' 20" E.
NUNAMOGUE	Village	Suro	8° 57' 14" S., 125° 32' 48" E.
NUTUR (or Betano)	Village	Suro	9° 09' 48" S., 125° 42' 48" E.
OAI-CUAC	Village	Sao Domingos	8° 28' 10" S., 126° 19' 06" E.
OBAGUI	Trig.	Manatuto	8° 34' 30" S., 126° 04' 11" E.
OBIDOS, NOVA (See Lete-Foho)	Posto Town	Suro	8° 50' S., 125° 25' 14" E.
OILEU	Village	Fronteira	9° 02' 11" S., 125° 16' E.
OLIVEIRA (See Fatu-Mean)	Posto Town	Fronteira	9° 14' 20" S., 125° 01' E.

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Place Names and Alternate Names	Description	Province	Reference
OPA	Village	Fronteira	9° 12' 06" S., 125° 18' E.
OSSU-ACA	Village	Sao Domingos	8° 40' S., 126° 19' 06" E.
OSSU-ALA	Village	Sao Domingos	8° 37' 10" S., 126° 18' 14" E.
OSSU-CHELI	Village	Sao Domingos	8° 34' 20" S., 126° 16' 30" E.
OSSU-RUA	Village	Sao Domingos	8° 46' S., 126° 23' 48" E.
OSSU (See Belas)	Posto Town	Sao Domingos	8° 45' S., 126° 22' 10" E.
OSSU-LARI	Village	Sao Domingos	8° 52' 10" S., 126° 26' 11" E.
OSO-CAI	Village	Fronteira	8° 59' 45" S., 125° 26' E.
OSSUNA	Village	Sao Domingos	8° 39' S., 126° 37' 48" E.
QUREM, NOVA (See Atsabe)	Posto Town	Fronteira	8° 55' S., 125° 24' 11" E.
OURIQUE, VILA DE (See Laclubar)	Posto Town	Manatuto	8° 45' 20" S., 125° 54' 48" E.
PAIRARA	Trig.	Lautem	8° 26' 11" S., 126° 58' 14" E.
PAITCHAU	Trig.	Lautem	8° 30' S., 127° 10' 11" E.
PORTAL, NOVA (See Cal-Mauc)	Township	Manatuto	8° 40' 05" S., 125° 47' 04" E.
PRAIN	Village	Sao Domingos	8° 27' S., 126° 27' 20" E.
PUALACA	Township	Manatuto	8° 49' 48" S., 125° 57' 14" E.
PUBELES	Village	Fronteira	9° 05' 06" S., 125° 15' 06" E.
PUNAR	Village	Manatuto	8° 45' S., 125° 50' E.
PUNILALA	Village	Suro	8° 43' S., 125° 23' E.
PURAGOA	Village	Fronteira	8° 52' 30" S., 125° 16' 05" E.
POROS	Village	Lautem	8° 25' 30" S., 127° 06' 14" E.
PUREMA	Village	Fronteira	8° 55' 48" S., 125° 17' E.
QUERO	Village	Suro	8° 55' 48" S., 125° 39' E.
QUIBULAR	Village	Sao Domingos	8° 55' 48" S., 126° 15' E.
RAILACO	Posto Town	Suro	8° 40' 48" S., 125° 25' 11" E.
RAI-BELIRI	Village	Suro	8° 45' S., 125° 26' 20" E.
RAI-MEAN	Village	Suro	9° 14' S., 125° 29' E.
RAIMERA	Village	Suro	9° 00' 14" S., 125° 38' 10" E.
RAIMARO	Village	Lautem	8° 25' S., 126° 48' 06" E.
RASSA	Village	Lautem	8° 28' 11" S., 127° 01' 11" E.
REMEXIO	Posto Town	Dilli	8° 35' 10" S., 125° 39' 06" E.
RITA-BAU	Village	Fronteira	8° 59' 10" S., 125° 18' 48" E.
RO-NU	Village	Sao Domingos	8° 45' S., 126° 24' 14" E.
ROTAI	Village	Suro	8° 53' 14" S., 125° 25' E.
RUSA	Trig.	Lautem	8° 25' S., 127° 13' 20" E.
RUS-LAU	Village	Suro	8° 52' S., 125° 38' E.
SACAIQAN	Village	Manatuto	8° 55' 11" S., 125° 49' E.
SAENAMO (See Dia-Name)	Village	Lautem	8° 40' S., 127° 01' 14" E.
SAGRES, NOVA (See Tutuala)	Posto Town	Lautem	8° 23' 48" S., 127° 15' 14" E.
SAIQUITI	Village	Lautem	8° 20' 14" S., 126° 58' 30" E.
SALAZAR, VILA (See Baucau)	Posto Town	Sao Domingos	8° 28' S., 126° 27' 30" E.
SALGUEIROS (Lamsana Salt Pans)	Village	Manatuto	8° 31' S., 126° 02' E.
SAME (Vila Filameno da Camara)	Posto Town	Suro	9° 00' S., 125° 40' 11" E.
SAME	Village	Manatuto	8° 53' 48" S., 125° 47' 45" E.
SARIN	Village	Suro	8° 45' 05" S., 125° 34' 20" E.
SAMELAI	Village	Lautem	8° 22' 48" S., 127° 08' E.
SARAU	Village	Lautem	8° 23' S., 126° 52' 11" E.
SILVA, VILA CELESTINO DA (See Hatu-Lia)	Posto Town	Suro	8° 48' S., 125° 02' 14" E.
SOIBADA	Township	Manatuto	8° 52' S., 125° 56' 11" E.
SOLIPUPURA	Trig.	Lautem	8° 23' 48" S., 127° 09' 14" E.
SOLOI	Village	Suro	8° 42' S., 125° 32' 11" E.
SOLUQUIN	Village	Manatuto	8° 53' 20" S., 125° 48' 14" E.
SUAI	Township	Fronteira	9° 21' S., 125° 17' E.
SUCU-RAI	Village	Suro	9° 05' 30" S., 125° 33' 20" E.
SUMULO	Village	Suro	9° 02' 48" S., 125° 40' 14" E.
SURO	Village	Suro	9° 02' 48" S., 125° 29' 10" E.
TACO-LULIC	Village	Suro	8° 42' 11" S., 125° 25' E.
TAI-BESSI	Village	Dilli	8° 34' 20" S., 125° 36' E.
TAILACO	Village	Fronteira	8° 45' S., 125° 05' E.
TALO	Township	Suro	8° 48' S., 125° 23' E.
TALO MENARO	Village	Dilli	8° 44' S., 125° 11' 20" E.
TAROMAN	Trig.	Fronteira	9° 13' 20" S., 125° 09' 14" E.
TATA	Village	Suro	8° 48' 11" S., 125° 17' E.
TATA-MAILAU	Trig.	Border, Fronteira and Suro	8° 54' 08" S., 125° 29' 07" E.
TATA-MAU	Trig.	Sao Domingos	8° 49' S., 126° 14' 20" E.
TEIN	Trig.	Lautem	8° 32' 48" S., 127° 05' 48" E.
THREE SPURS	Village	Dilli	8° 38' 48" S., 125° 29' E.
TIBAR (Nova Alges)	Posto Town	Dilli	8° 34' 14" S., 125° 29' 14" E.
TILOMAR	Posto	Fronteira	9° 21' 30" S., 125° 07' 14" E.
TIROLALA	Village	Suro	8° 57' 14" S., 125° 41' E.
TIRO-LIU	Village	Lautem	8° 45' S., 126° 48' 11" E.
TURISCAI	Posto	Manatuto	8° 50' S., 125° 43' E.
TUALO	Village	Lautem	8° 45' 48" S., 126° 40' 14" E.
TUTOLORO	Village	Suro	8° 57' S., 125° 42' 02" E.
TUTUALA (Nova Sagres)	Posto Town	Lautem	8° 23' 48" S., 127° 15' 06" E.
UA-CAI	Village	Sao Domingos	8° 55' 20" S., 126° 19' E.
UAI-OLU	Village	Sao Domingos	8° 57' 14" S., 126° 16' 14" E.
UAI-TAMO	Village	Sao Domingos	8° 45' S., 126° 29' 05" E.

Gazetteer of Towns and Villages in Portuguese Timor—Continued

Place Names and Alternate Names	Description	Province	Reference	
UATO-CARABAU (Nova Bemfica)	Posto Town	Lautem	8° 42' S.,	126° 41' 48" E.
UATO-RUSO	Trig.	Lautem	8° 41' 48" S.,	126° 38' E.
UATO-LARI (Leca)	Posto Town	Sao Domingos	8° 46' 11" S.,	126° 34' 05" E.
UE-LOLO	Village	Manatuto	8° 56' 48" S.,	126° 11' 48" E.
UE-METAN	Village	Manatuto	8° 56' S.,	126° 10' 30" E.
UE-TORA	Village	Sao Domingos	8° 57' S.,	126° 16' E.
UNAFÁ	Village	Lautem	8° 30' 14" S.,	126° 56' E.
VE-BABO	Village	Sao Domingos	8° 39' 48" S.,	126° 27' 11" E.
VEI-LULUTO	Village	Sao Domingos	8° 55' 48" S.,	126° 17' 06" E.
VEI-LAIVAI (See Silvicola)	Village	Lautem	8° 39' 48" S.,	126° 58' E.
VE-LABA	Village	Manatuto	8° 59' 11" S.,	126° 08' 45" E.
VEMASSE	Posto Town	Sao Domingos	8° 31' 14" S.,	126° 13' E.
VENILALE (Vila Vicosa)	Posto Town	Sao Domingos	8° 38' 48" S.,	126° 22' 14" E.
VEI-PERE	Village	Sao Domingos	8° 52' S.,	126° 19' E.
VILA ARMINDO MONTEIRO (See Bobonaro)	Posto Town	Fronteira	9° 01' 11" S.,	125° 21' 11" E.
VILA DE AINARO (See Ainaro)	Posto Town	Suro	9° 00' 20" S.,	125° 31' E.
VILA DE AVIS (See Fulgoro)	Posto Town	Lautem	8° 27' S.,	127° 00' 11" E.
VILA CELESTINO DA SILVA (See Hatu-Lia)	Posto Town	Suro	8° 48' S.,	125° 21' 20" E.
VILA EDUARDO MARQUES (See Bazar-Tete)	Posto Town	Dilli	8° 39' S.,	125° 23' 14" E.
VILA DE ERMERA (See Ermera)	Posto Town	Suro	8° 46' S.,	125° 23' 14" E.
VILA FILAMENO DA CAMARA (See Same)	Posto Town	Suro	9° 00' S.,	125° 40' 14" E.
VILA GENERAL CARMONA (See Alieu)	Posto Town	Suro	8° 44' S.,	125° 34' E.
VILA DE LIQUICA (See Liquissa)	Posto Town	Dilli	8° 36' S.,	125° 19' 11" E.
VILA DE MANATUTO (See Manatuto)	Posto Town	Manatuto	8° 31' S.,	126° 01' E.
VILA NOVA MALACA (See Lautem)	Posto Town	Lautem	8° 22' 55" S.,	126° 54' E.
VILA DE OURIQUE (See Laclubar)	Posto	Manatuto	8° 45' 14" S.,	125° 54' 48" E.
VILA SALAZAR (See Baucau)	Posto Town	Sao Domingos	8° 28' S.,	126° 27' E.
VILA VICOSA (See Venilale)	Posto Town	Sao Domingos	8° 38' 08" S.,	126° 22' 14" E.
VILLA MARIA	Township	Suro	8° 47' 20" S.,	125° 24' 14" E.
VIQUEQUE	Posto Town	Sao Domingos	8° 52' S.,	126° 21' 14" E.
VIRIATA (See Hatu-Bullloo)	Township	Suro	8° 54' 14" S.,	125° 31' 14" E.
VISTA, BOA . . . (See Calical)	Posto Town	Sao Domingos	8° 34' S.,	126° 36' E.
VIRAC	Trig.	Sao Domingos	8° 32' S.,	126° 16' 30" E.

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100. Looking south-southwest from Rusa Trig. point.
101. From Rusa looking northwest.
102. Nelu from a point between Rusa and Nelu.

SECTION II—LIST OF MAPS AND PLANS

Maps:

1. Portuguese Timor (Amended from 1 : 250,000).
2. Strip maps. South Coast; Betano to Jaco Strait. Scale 2 miles to 1 inch.
3. Dilli-Aileu-Maubisse. By D. of I. Scale 1 : 80,000.
4. Dilli and vicinity. By D. of I. Scale 4 inches to 1 mile. (See Photo No. 16).
5. Beasso and vicinity—Sketch Map.
6. Portuguese Timor—Dutch Chart No. 117.

Towns and Locality Plans:

Fronteira Province:

7. Atsabe.
8. Beco. (See Photo No. 6).
9. Bobonaro. (See Photo No. 12).
10. Mape.
11. Suai. (See Photo No. 4).

Dilli Province:

12. Aipelo.
13. Liquissa. (See Photo No. 14).

Suro Province:

14. Aileu. (See Photo No. 36).
15. Ainaro.
16. Ermera.
17. Hatu-Udo.
18. Lete-Foho.
19. Same.

Manatuto Province:

20. Manatuto. (See Photo No. 54).

Sao Domingos Province:

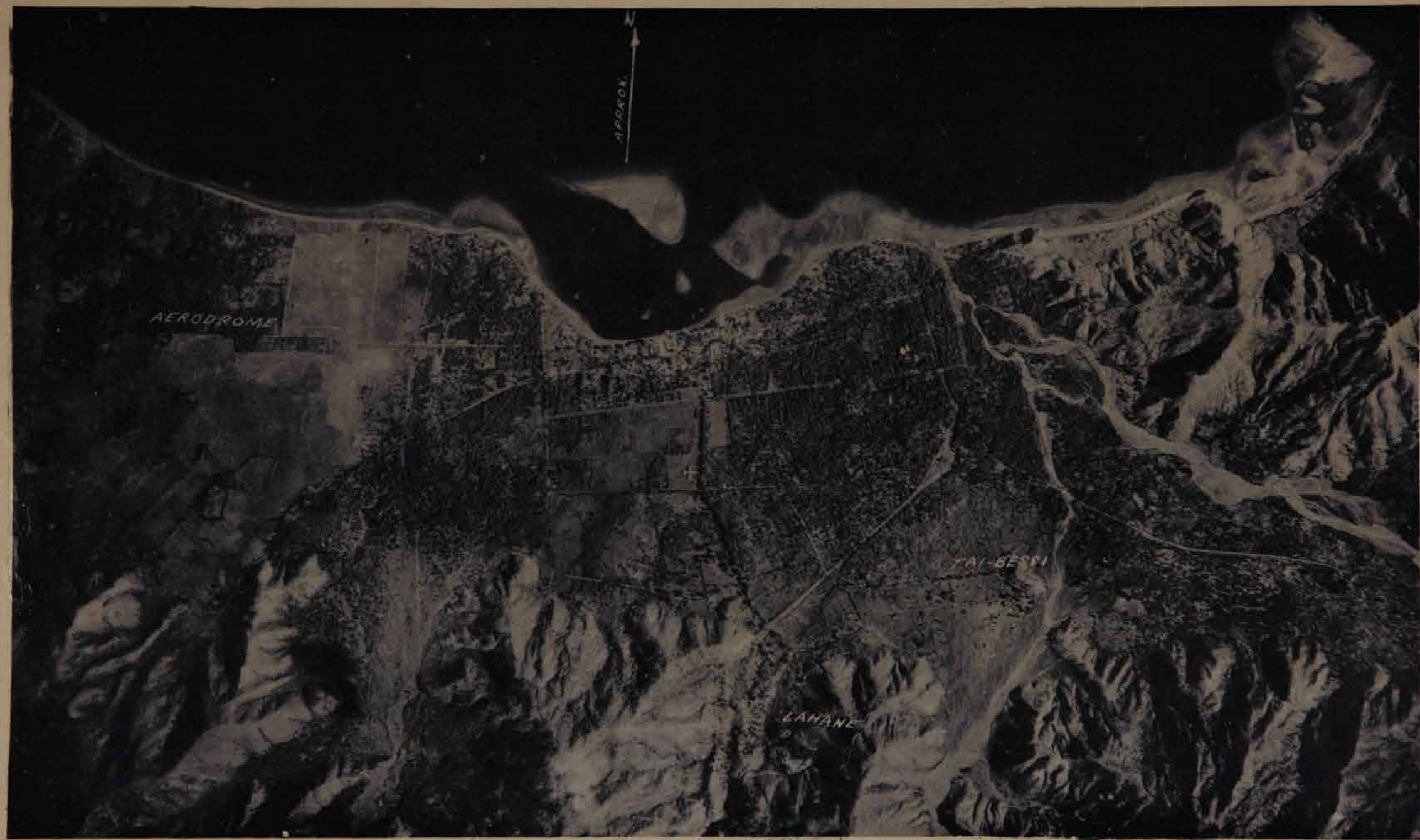
21. Aliambata. (See Photo No. 68).
22. Baucau.
23. Baucau and Anchorage.
24. Laga.
25. Venilale. (See Photo No. 84).
26. Vemassee.
27. Viqueque. (See Photo No. 82).

Lautem Province:

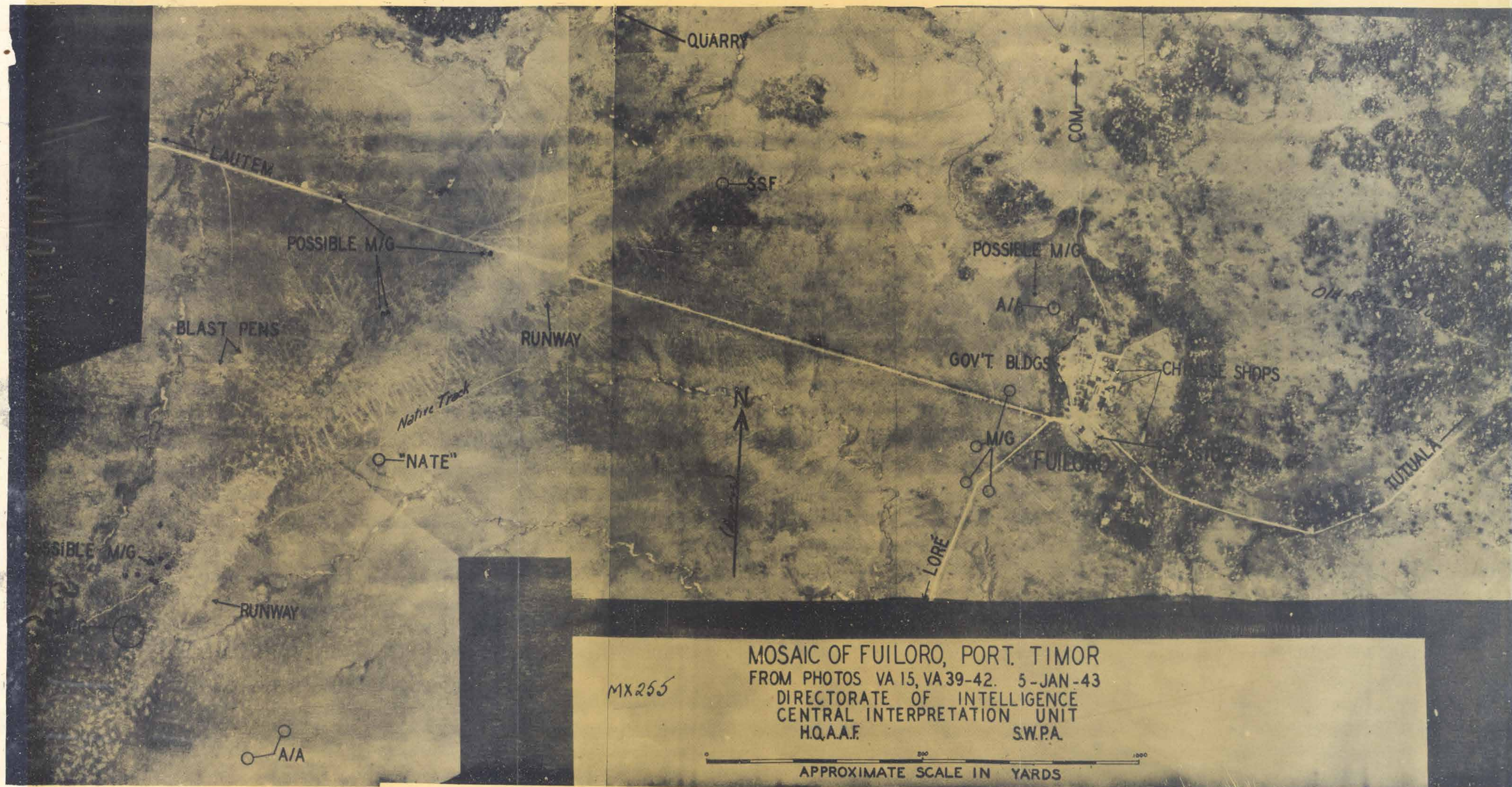
28. Elomar. (See Photo No. 90).
29. Fuiloro. (See Photo No. 3).
30. Laivai.
31. Lautem. (See Photo No. 85).
32. Saenamo. (See Photo No. 91).
33. Portuguese Timor, 1 : 250,000 by 648 Topo. Bn. USA, incorporating and supplementing Map No. 1 and to be distributed approximately 1st April, 1943.

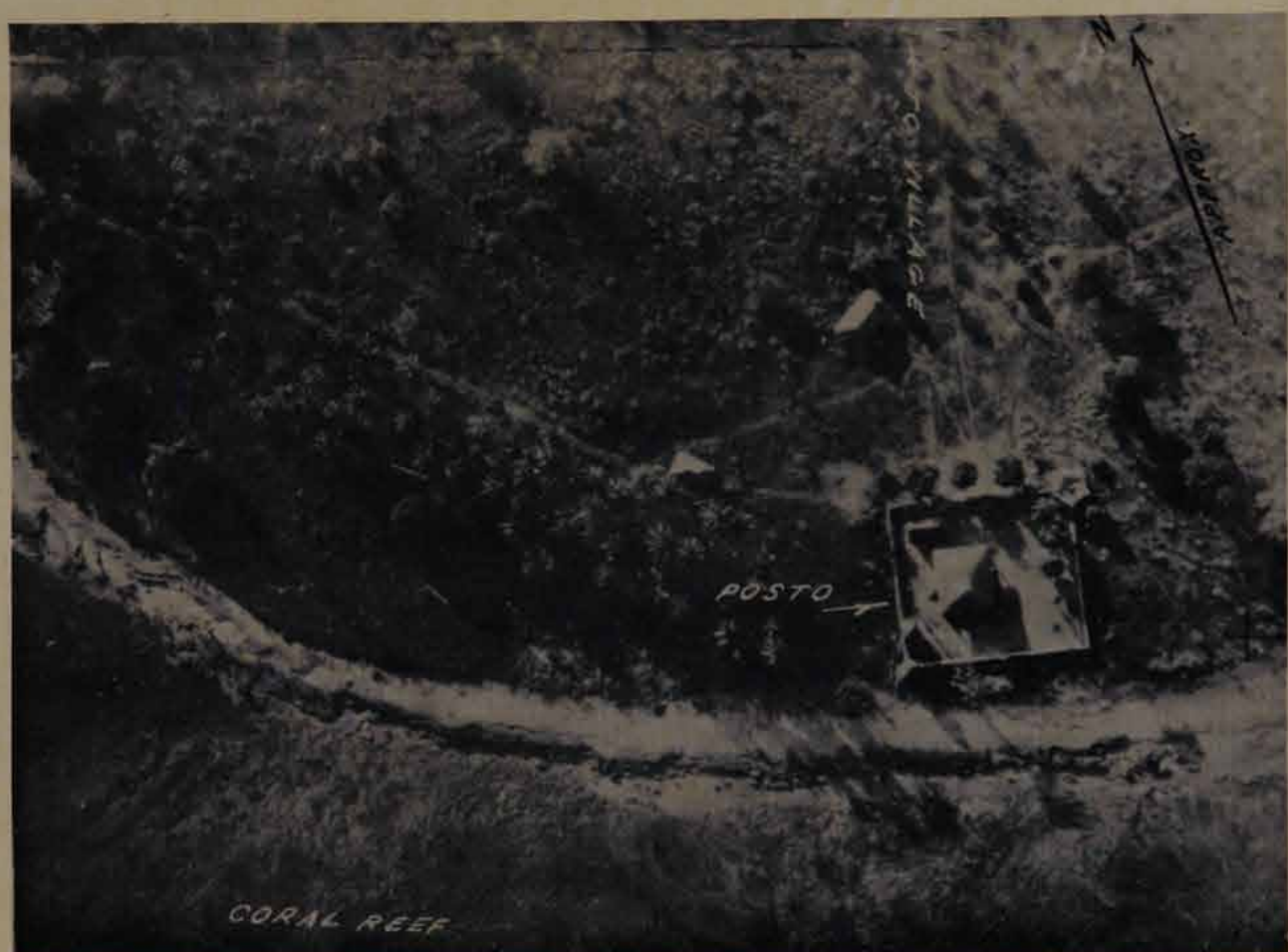
Maps Included in Text:

- Timor Island Airdromes, page 2.
- Suggested runway of Cumnassa air strip, page 4.
- Geological Map, page 59.
- Vegetation, page 61.
- Telephone Communications, page 63.
- Meteorological, page 74.

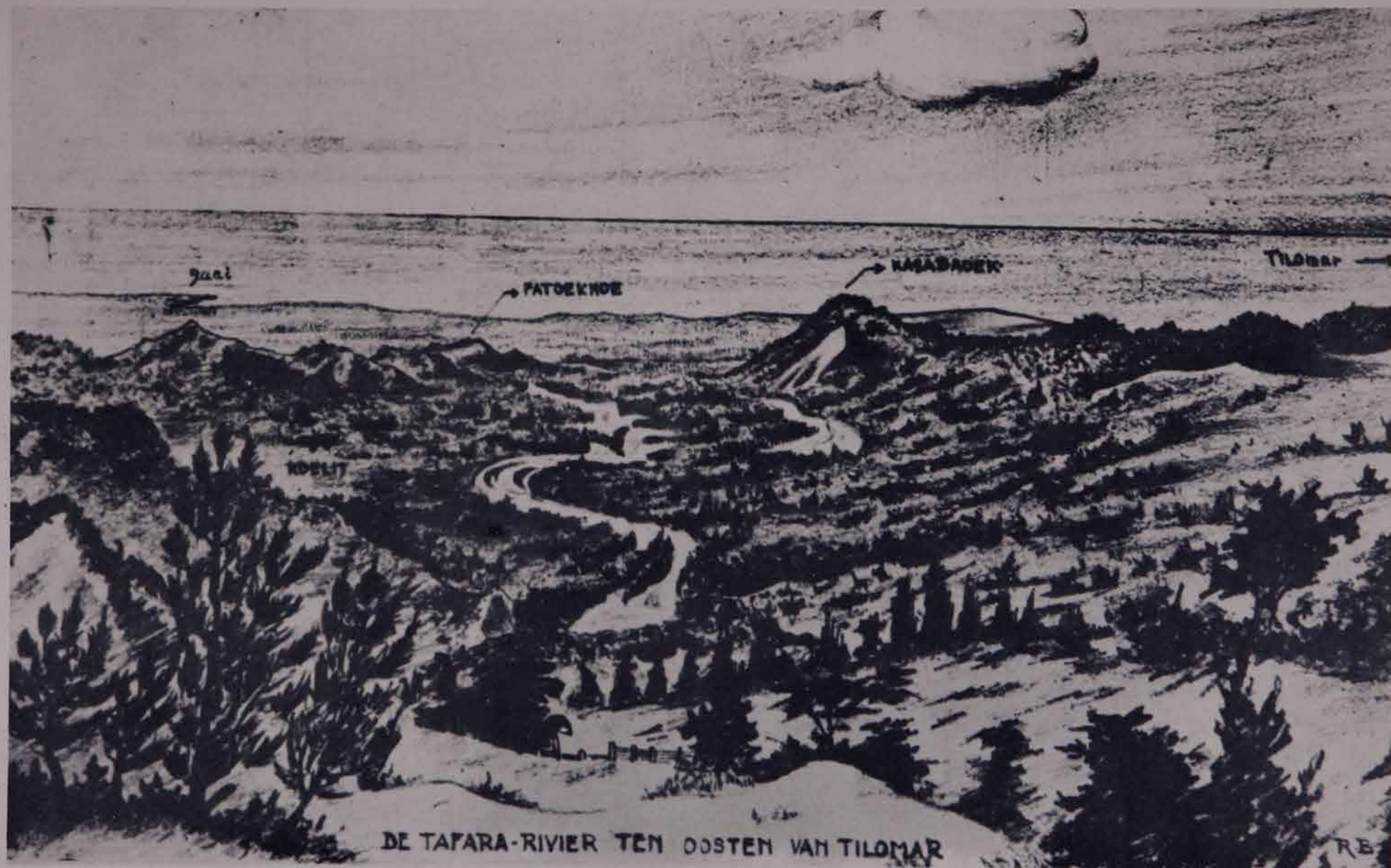


1. Dilli, showing airdrome west of town, (10/11/42)

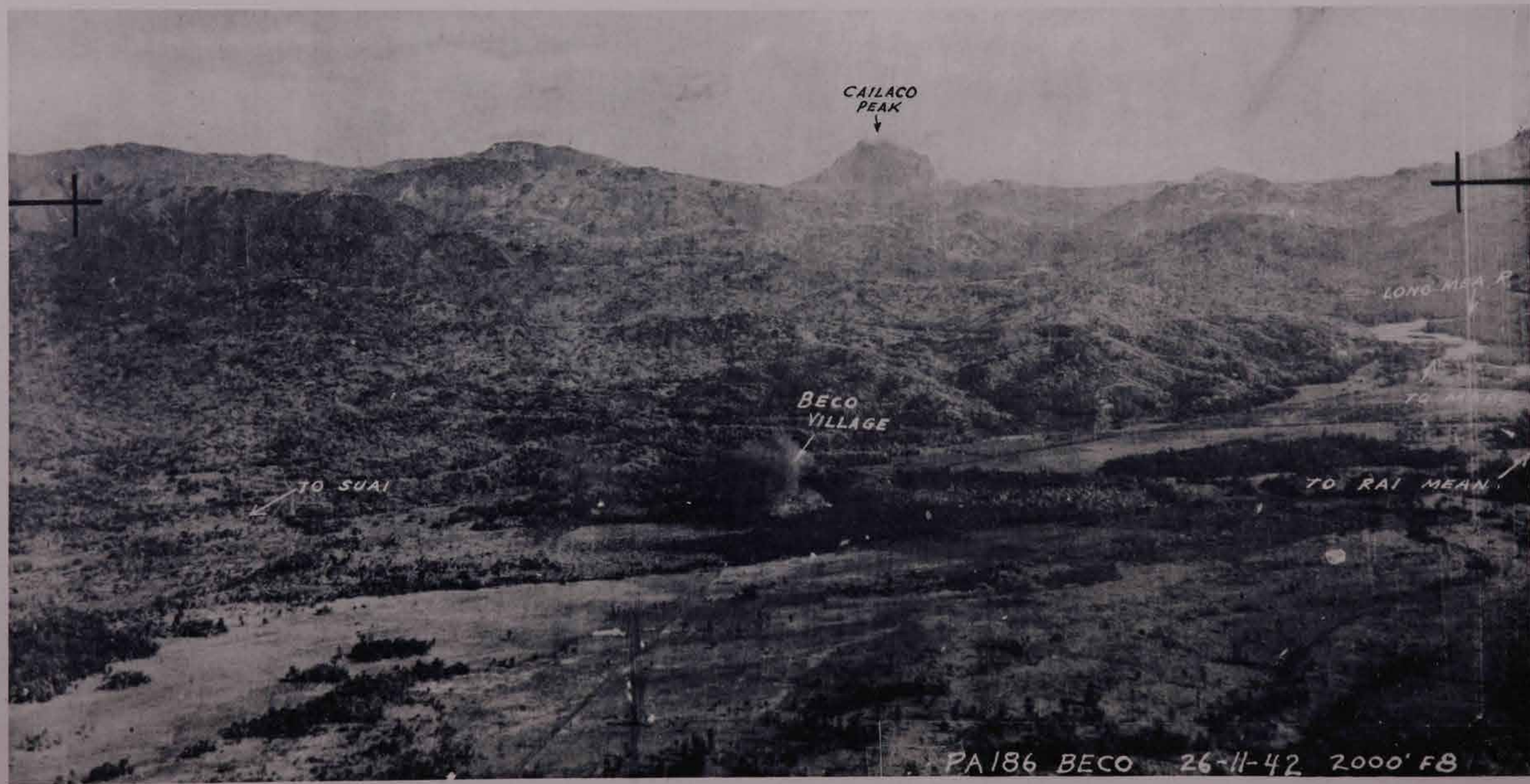




4. Suai (13/1/43). (See Map No. 11)



5. Tafara River. Sketch looking southeast from near Tilomar



6. Beco—oblique looking north (26/11/42)



7. Bobonaro and surrounding country—oblique from southwest, showing track to Dilli (5/11/42)



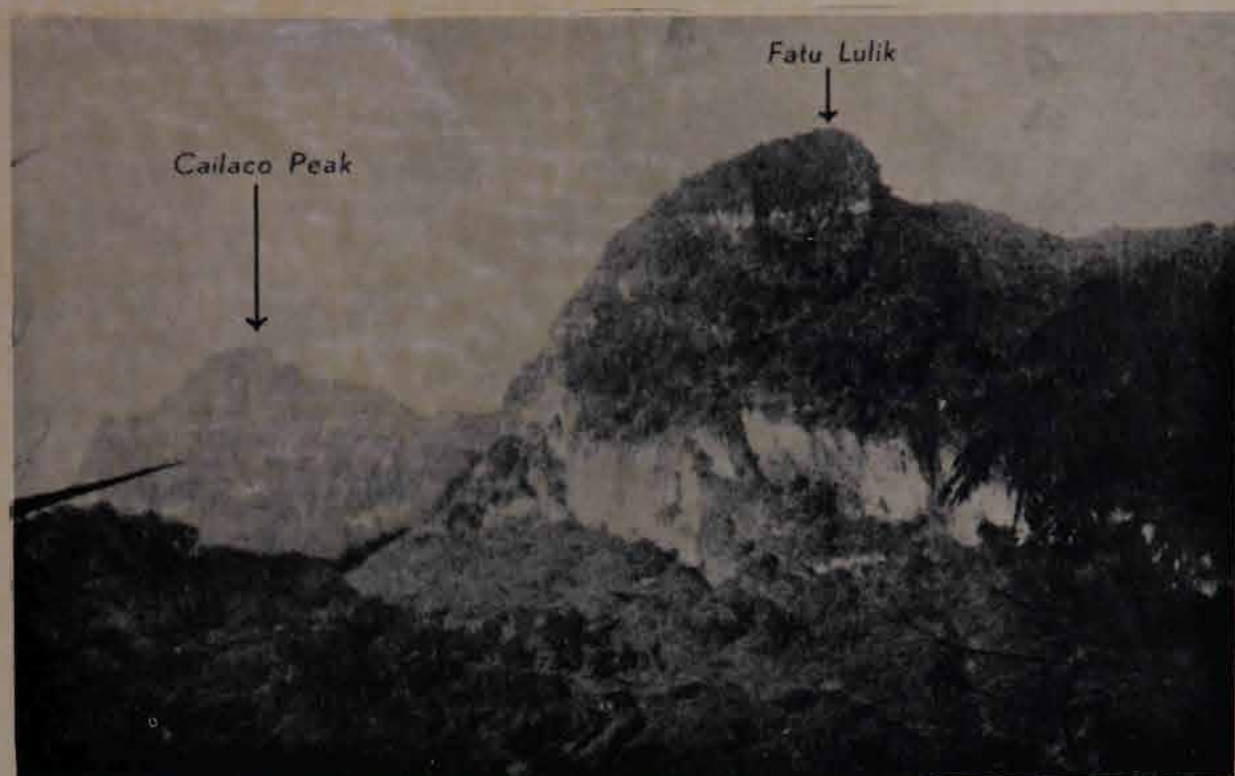
8. Lois Valley, looking northwest from Hatu-Lia; Lauela, Marobo and Be-Bai Rivers



9. Nunura Plains



10. Marobo River and Mount Cailaco seen from Hatu-Lia, looking southwest



11. Fatu topography in Central Divide Area: Fatu-Lulic and Cailaco Peak seen from Cailaco



12. Bobonaro—vertical (2/11/42). (See Map No. 9)



Lolotoi -

22-23-24/ Bezök aan Lolotoi

13. Posto fort building—Lolotoi. Drawing



14. Liquissa—vertical (24/6/42). (See Map No. 13)

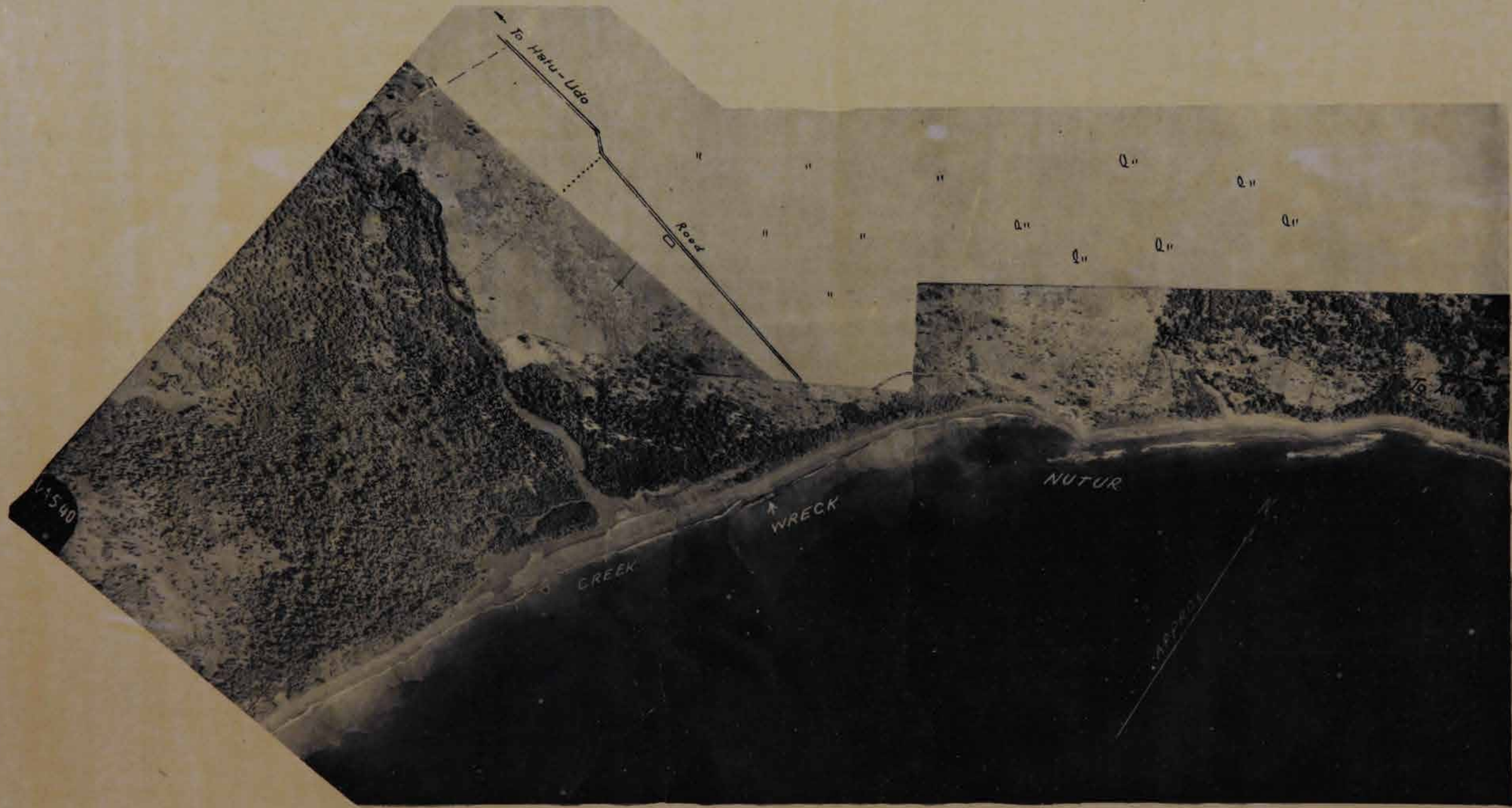


15. Dilli—oblique: Coastline to the East (24/1/43)





17. Sue River—oblique looking north (14/11/42)



18. Betano—vertical (3/10/42)



19. Betano—oblique to north (14/11/42)



20. Betano—surf landing, Sept.-Oct., 1942



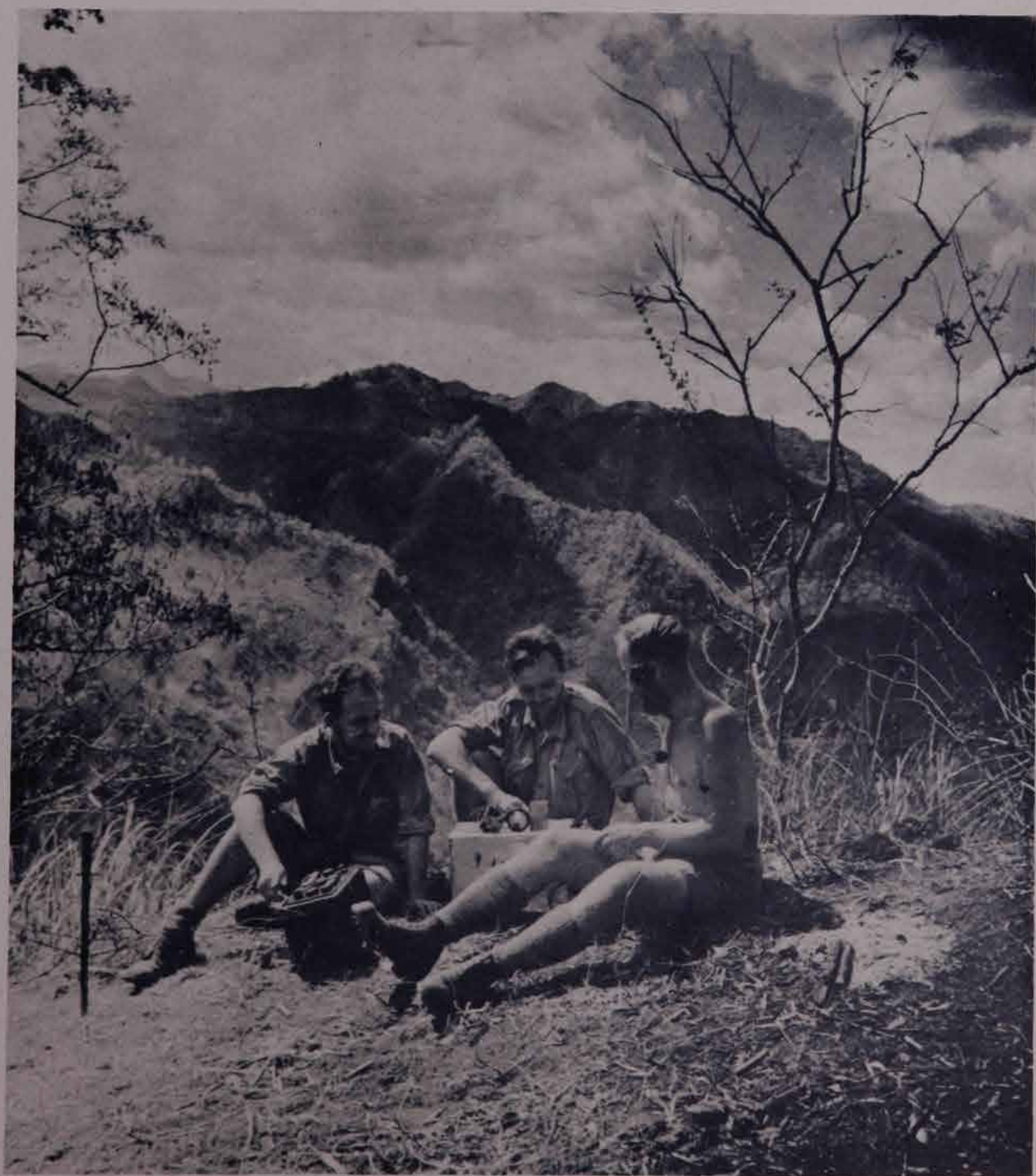
21. "Port Alas" (14/11/42)—Used as an embarkation point



22. South Lacro—oblique looking north (7/2/43)



23. Glano Plain looking south. Bridge was partially demolished



24. Near Mindelo



25. Typical river crossing near Mindelo



26. Forest near Mindelo



27. Mountain trail near Mindelo. Note pony and native carriers



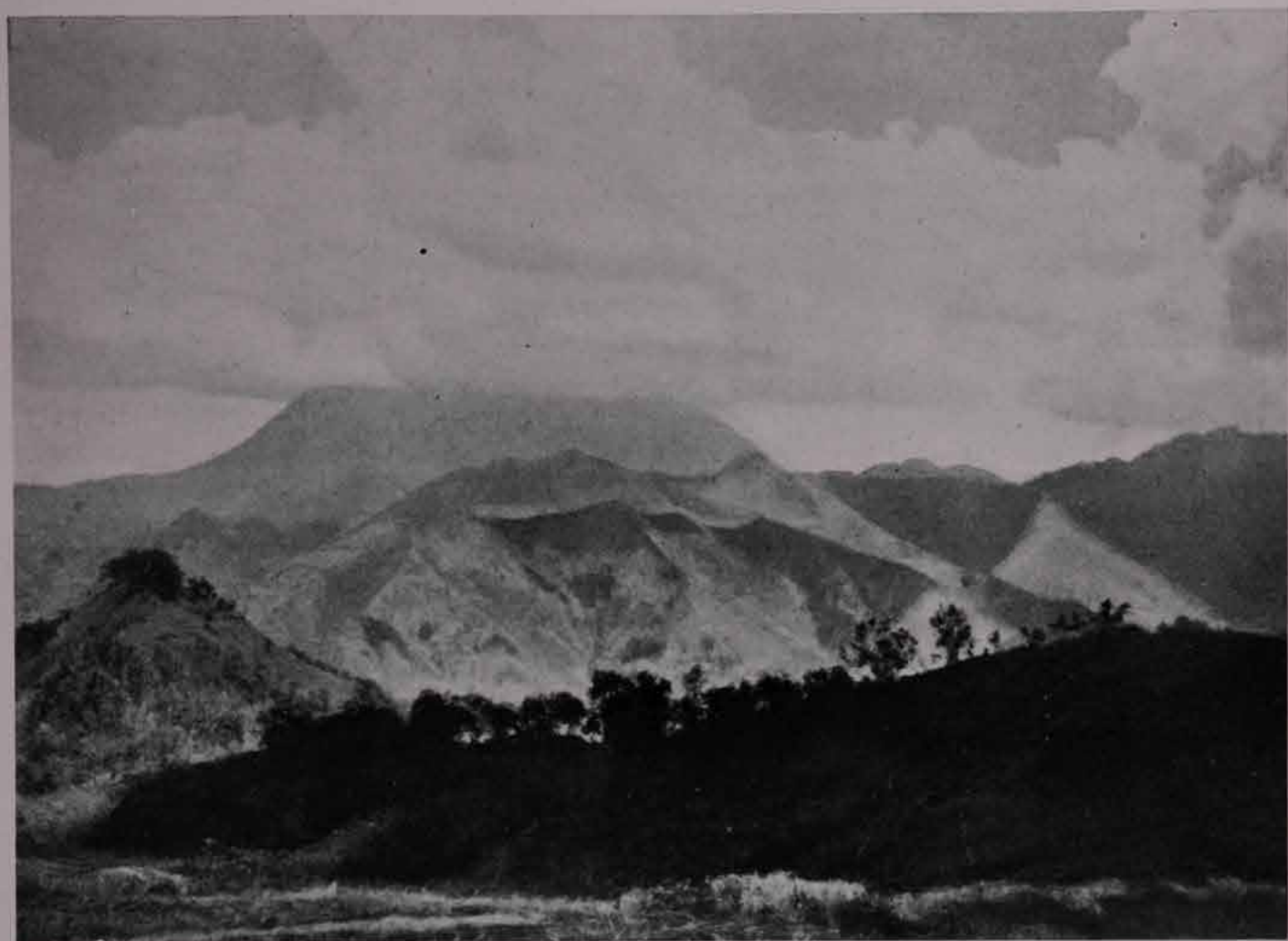
28. Fatu-Cuac. Young coconuts in background



29. Central mountain country. Mindelo looking east-southeast (17/12/42)



30. Central mountain country. Mindelo looking southwest



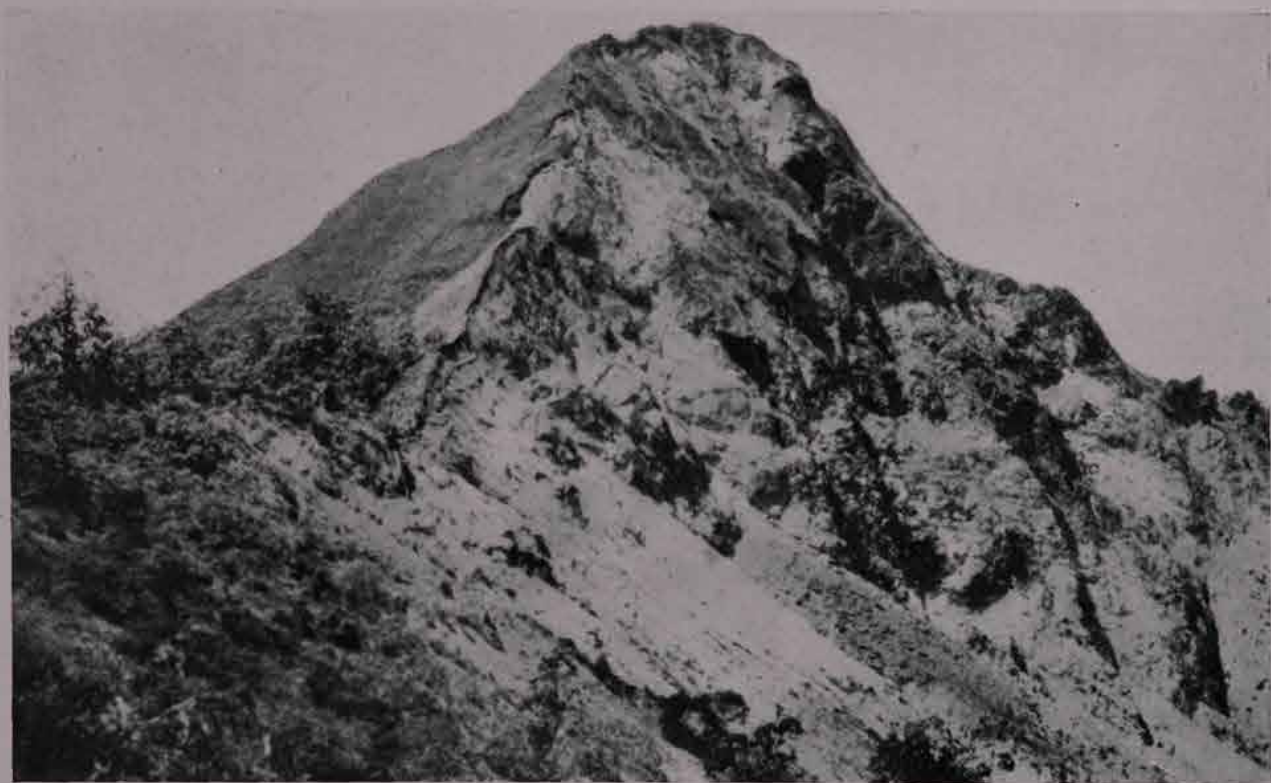
31. Cablac Mountain at mid-day



32. Ramelau and Cablac Ridges from Caitaba trig. station. Drawing



33. Typical gravel bed of Upper Sue River



34. Manufai Peak



35. Betano—Plain: looking southwest



36. Aileu looking south (4/11/42)



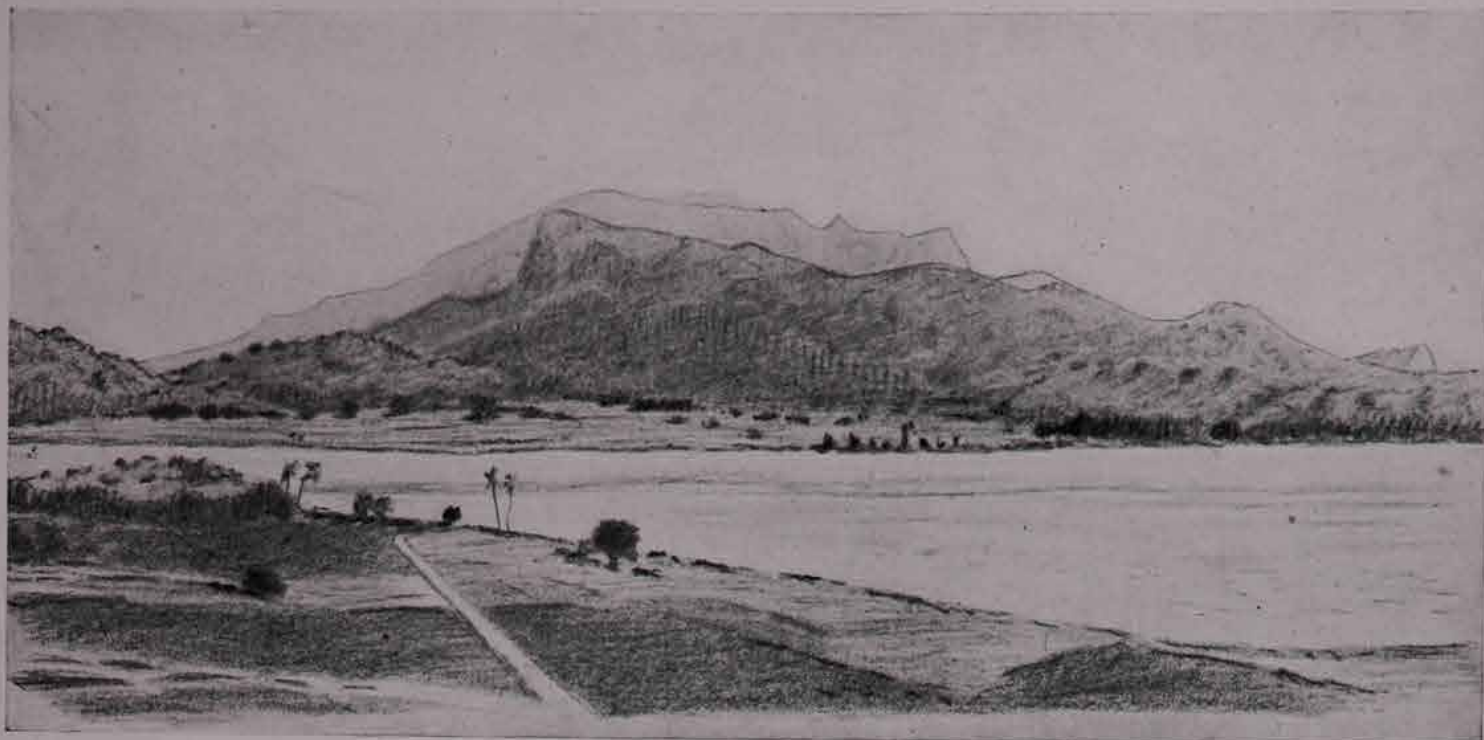
37. Aileu (4/11/42) looking west-southwest towards Lete-Foho



38. Maubisse (16/11/42)



39. Lamsana Bay (28/6/42)



40. Looking west to North Laclo River and Mt. Kuri. Drawing from 1 mile southwest of Manatuto



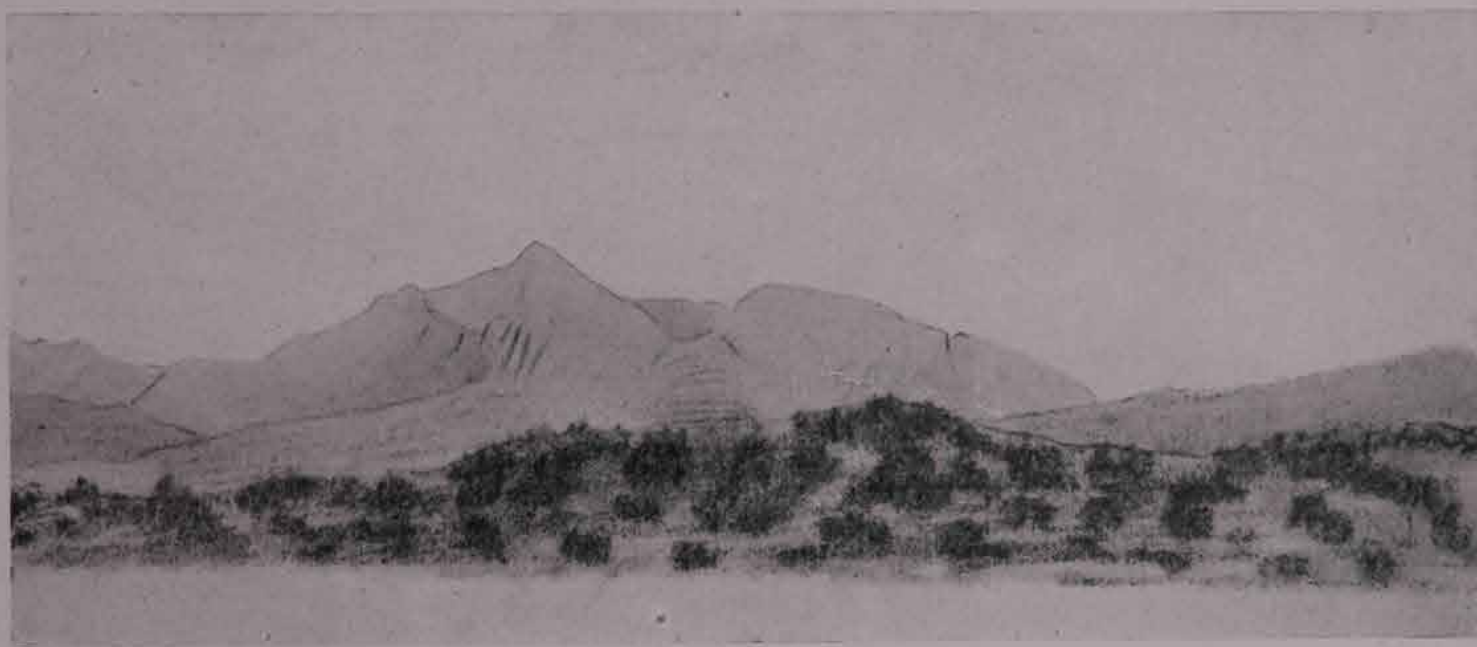
41. Looking southwest (Laclo River). Drawing from 1 mile southwest of Manatuto



42. Looking east. Drawing from 1 mile southwest of Manatuto.



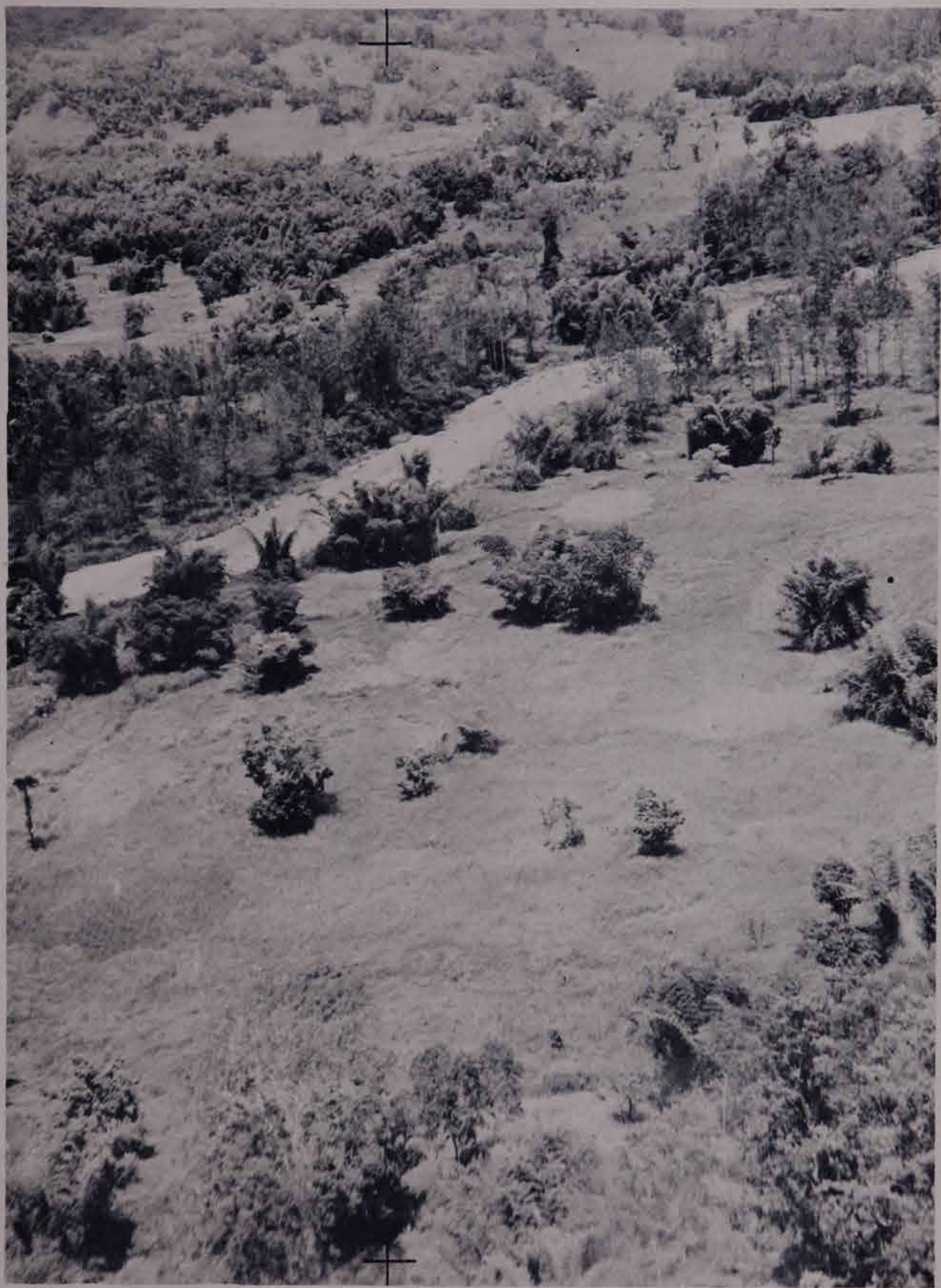
43. Looking north to sea from trig. point 3 miles southwest of Laleia



44. Looking to south from trig. point 3 miles southwest of Laleia



45. Laleia River looking south from Laleia



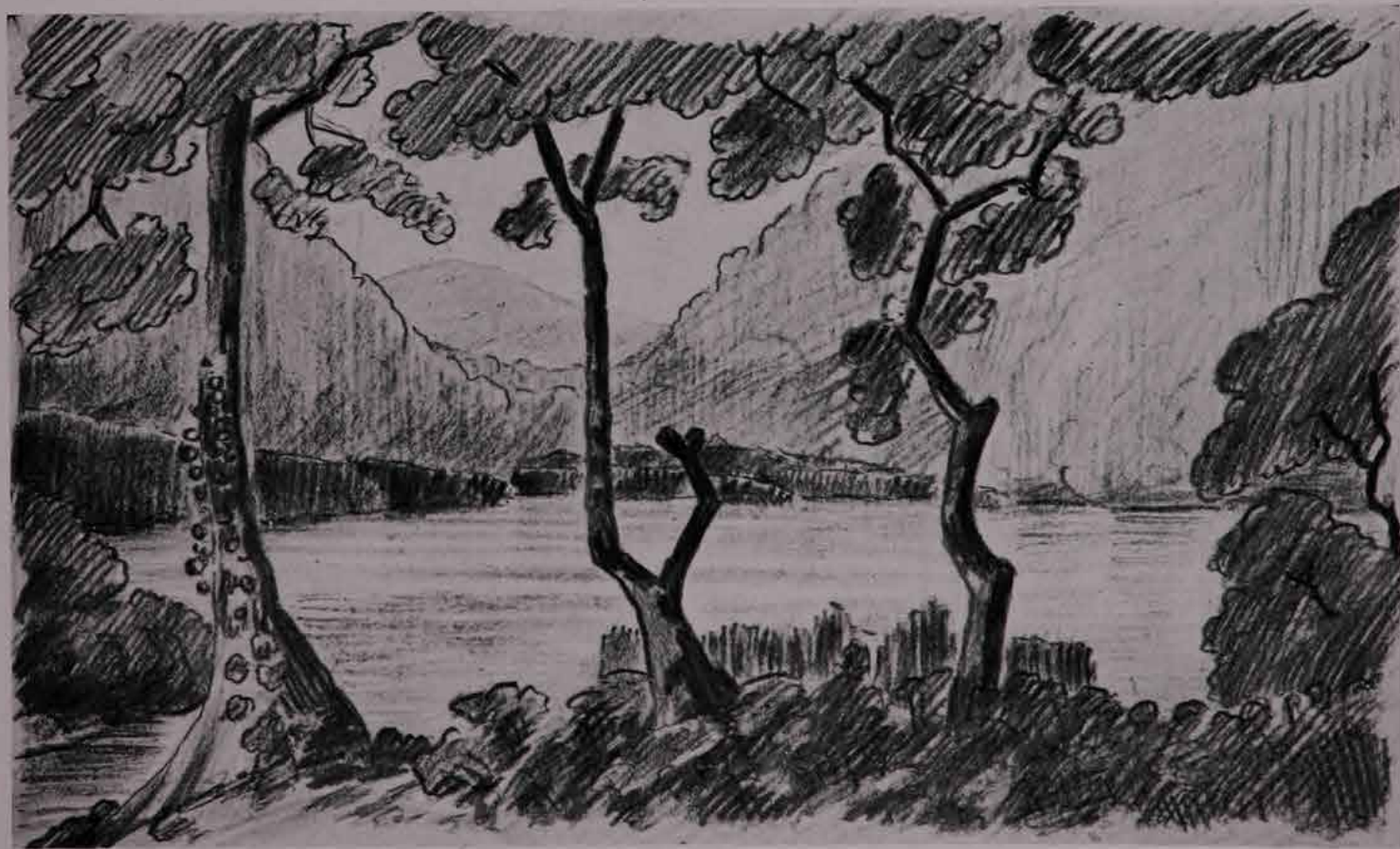
46. Lower Quic River looking northwest. (Note bamboos and typical topography)



47. Lower Quic Valley: Supplies dropping by parachute



48. Henoc—looking from southeast



49. Lake Lacluta (east of Lacluta)—view looking northeast



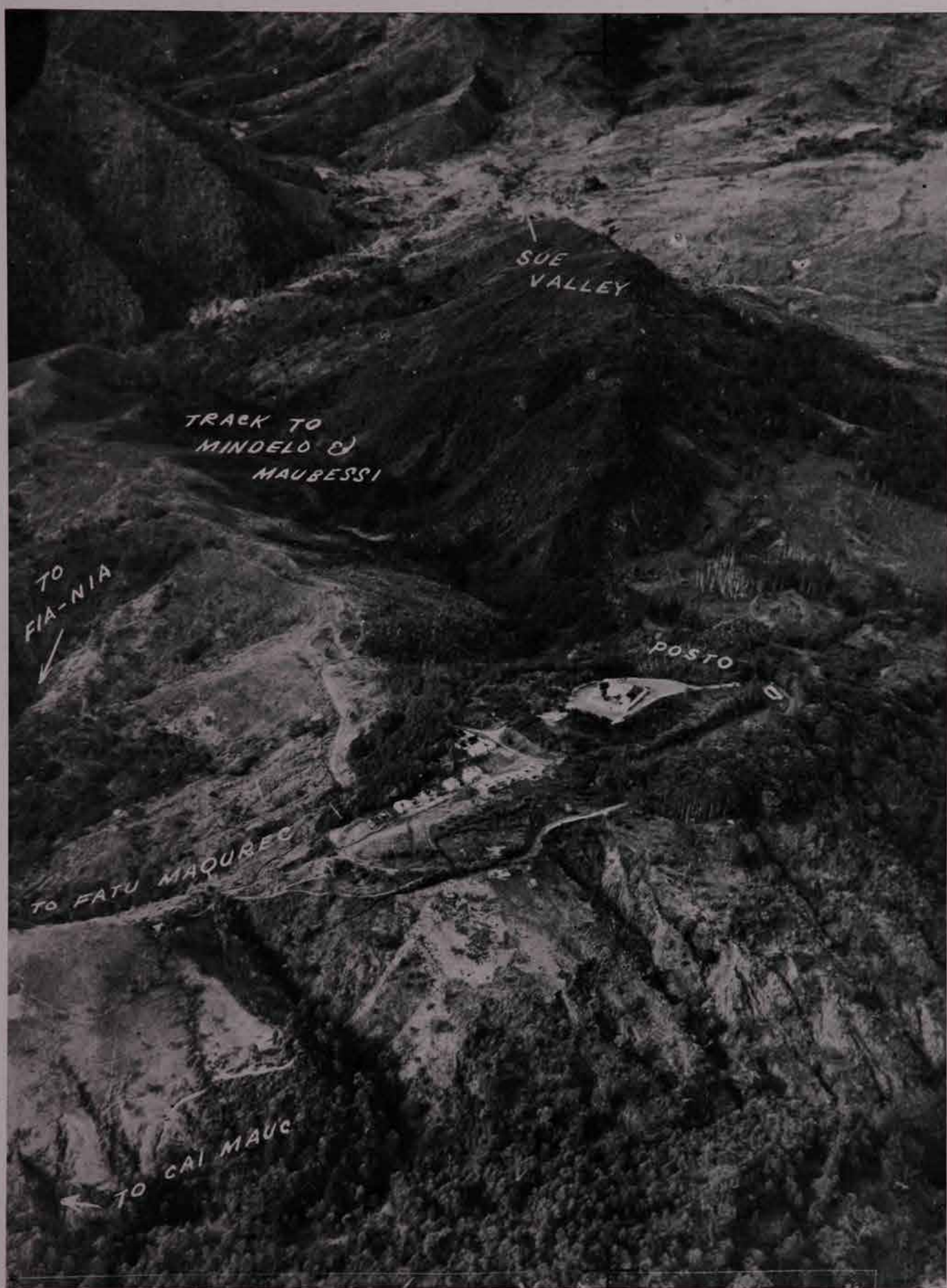
50. Looking southeast from a point near Lake Lacluta



51. View from Lacluta looking northeast



52. Dilor River looking northwest from Ailires



53. Turiscai—looking southwest (16/12/42)



54. Manatuto—looking northeast (21/8/42). (See Map No. 20)



55. Laleia (17/11/42)



56. Administrator's House, Manatuto



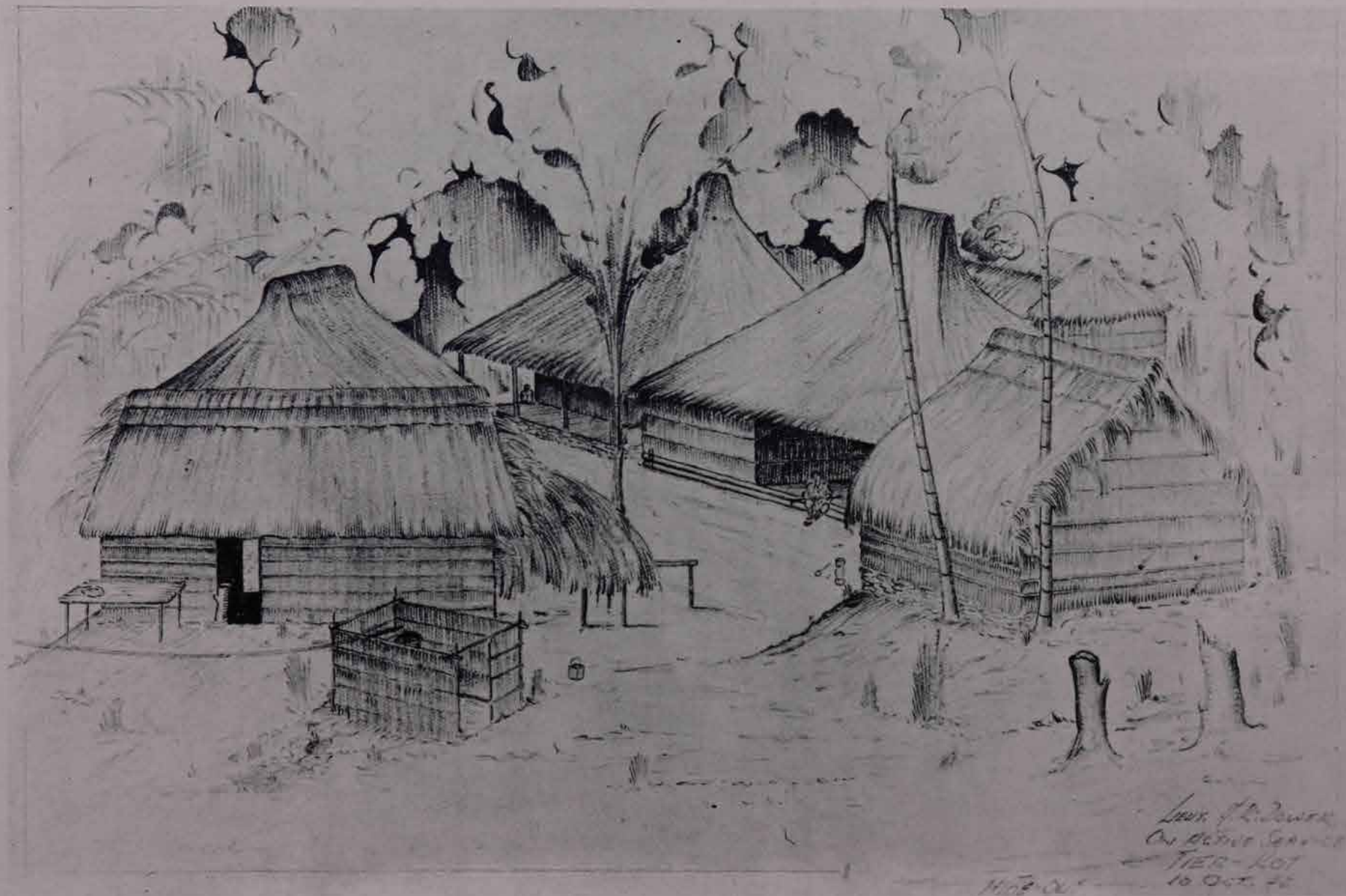
57. Fatu-Cuac Posto (native-constructed)



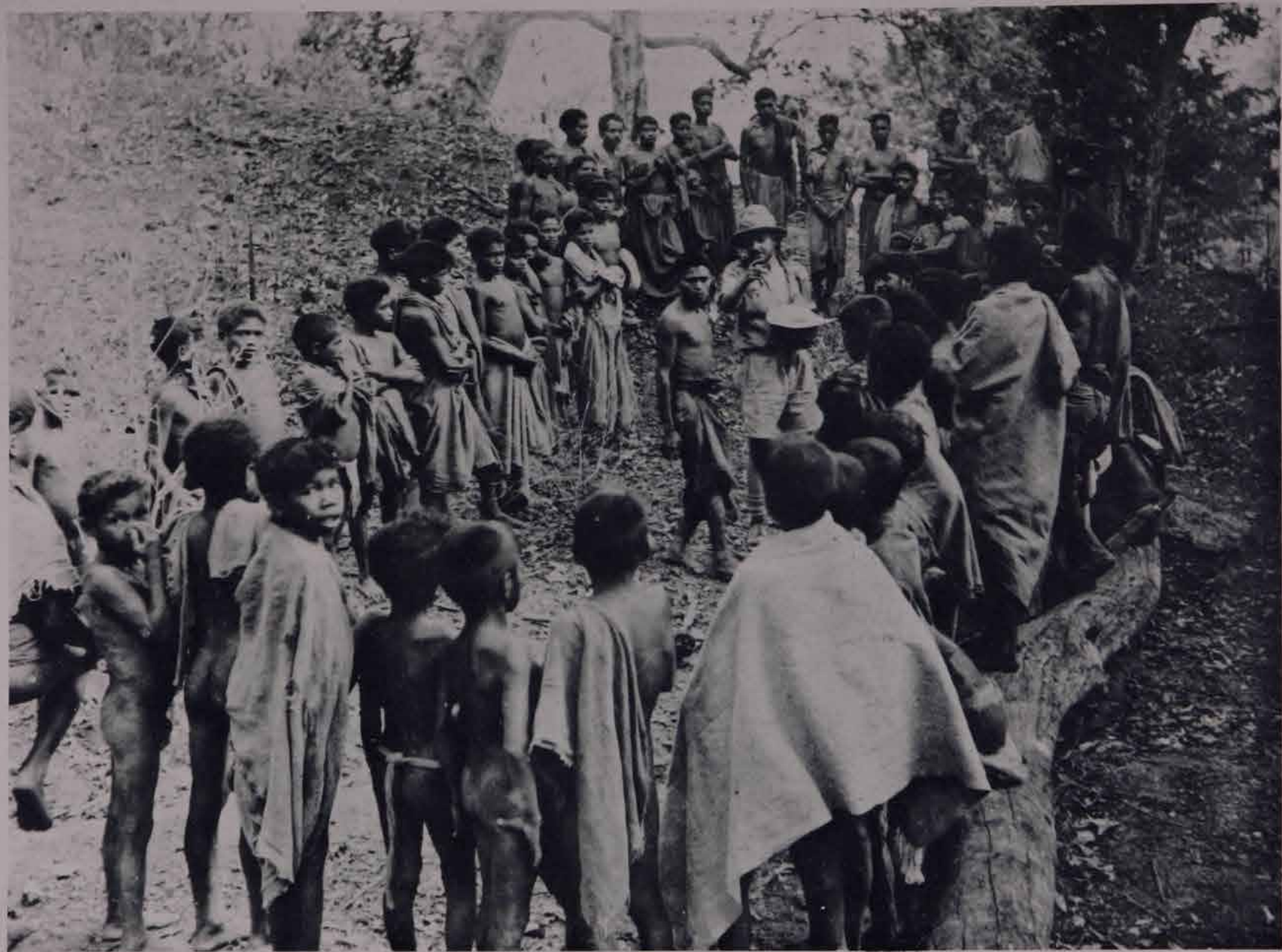
58. Native village—junction Clerec and Lower Quic Rivers looking northwest



59. Typical native village—Pualaca



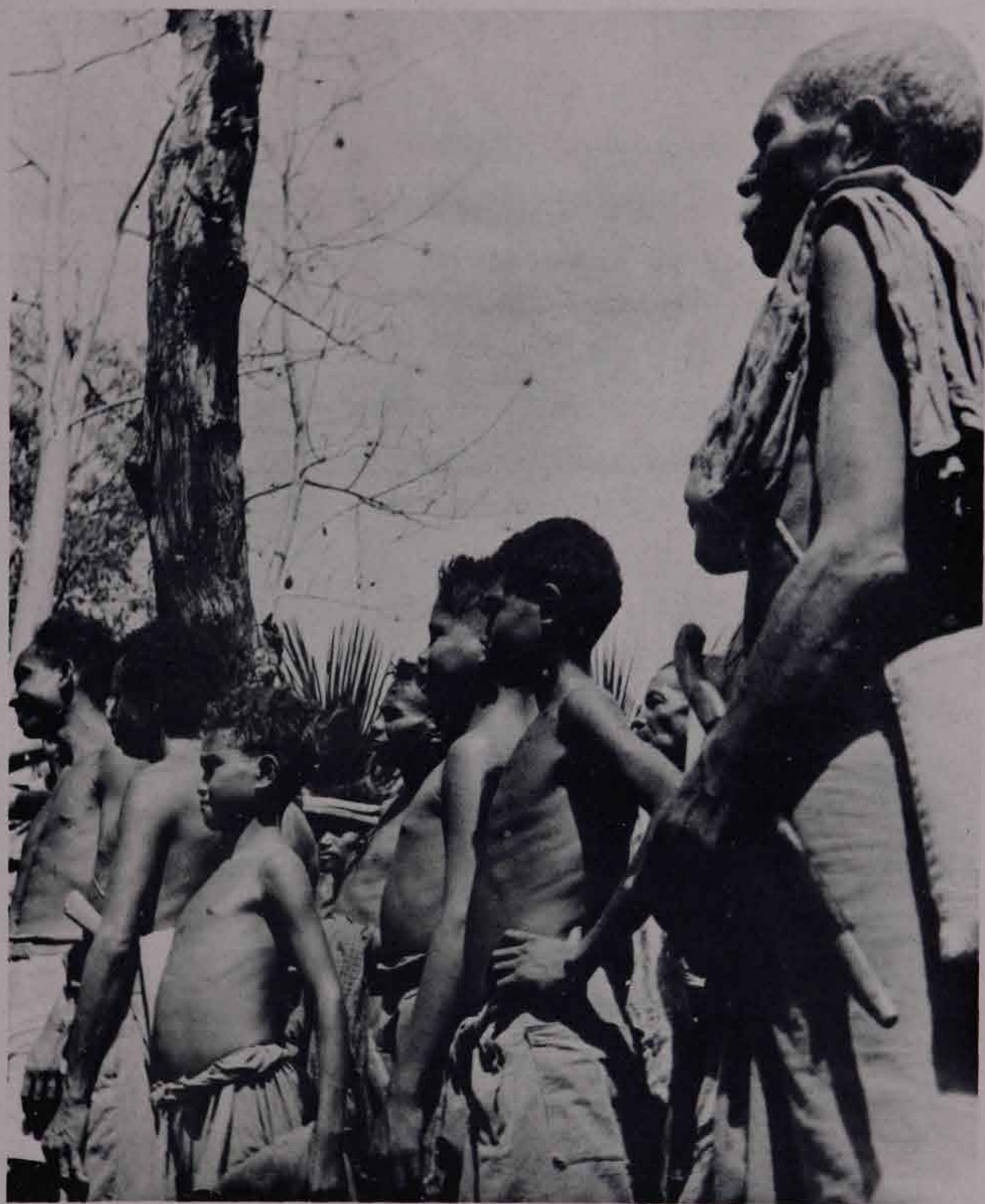
60. Native constructed huts—thatched roofs (Tier-Kot)



61. Group of natives near Ailalec



62. A typical native man near Ailalec



63. Typical creados (servants)



64. Vei Todo Creek (wet season)—oblique looking north, from west of
Cape Luca



65. Cuac River mouth (wet season)—oblique looking north (7/2/43)



66. Beasso looking north—further west showing two western anchorages
(12/11/42)



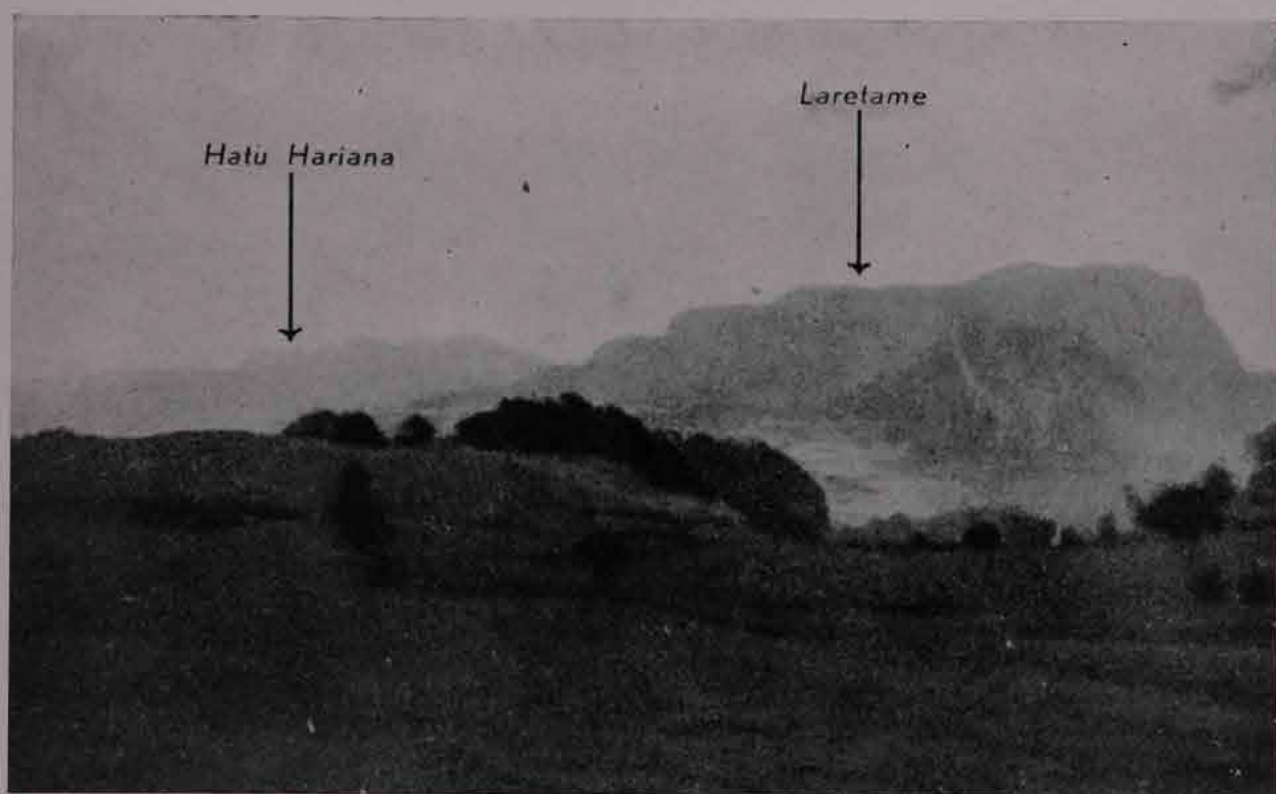
67. Beasso—oblique looking north showing main anchorage and village
(12/11/42)



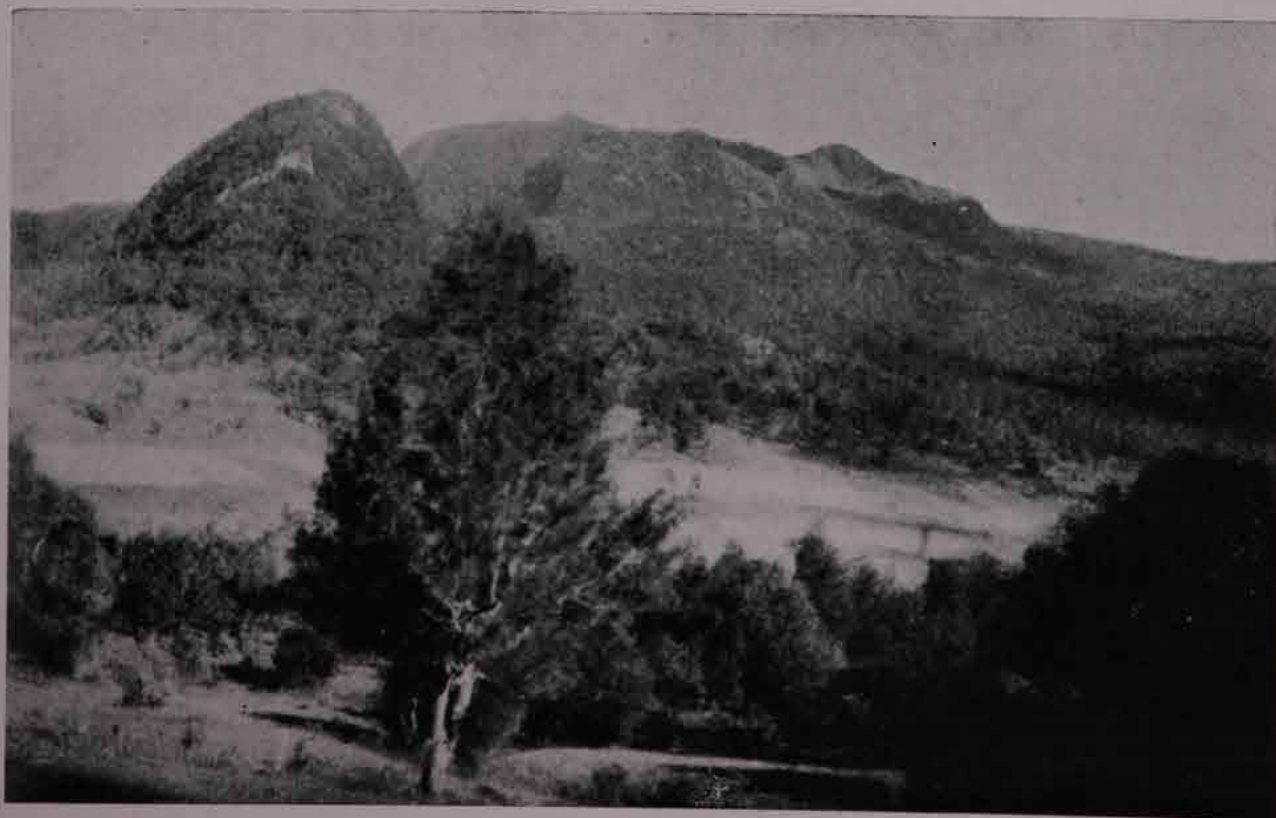
68. Aliambata (7/10/42). (See Map No. 21)



69. Looking south from half mile east of Manueto River—coastal road crossing at Mt. Virac



70. Fatu topography—Hatu Arianá and Laretame Mountains seen from Venilale (Vila bicosa)



71. Mundo Perdido and Ossu Mountains seen from east



72. Mata-Bia from Ossu



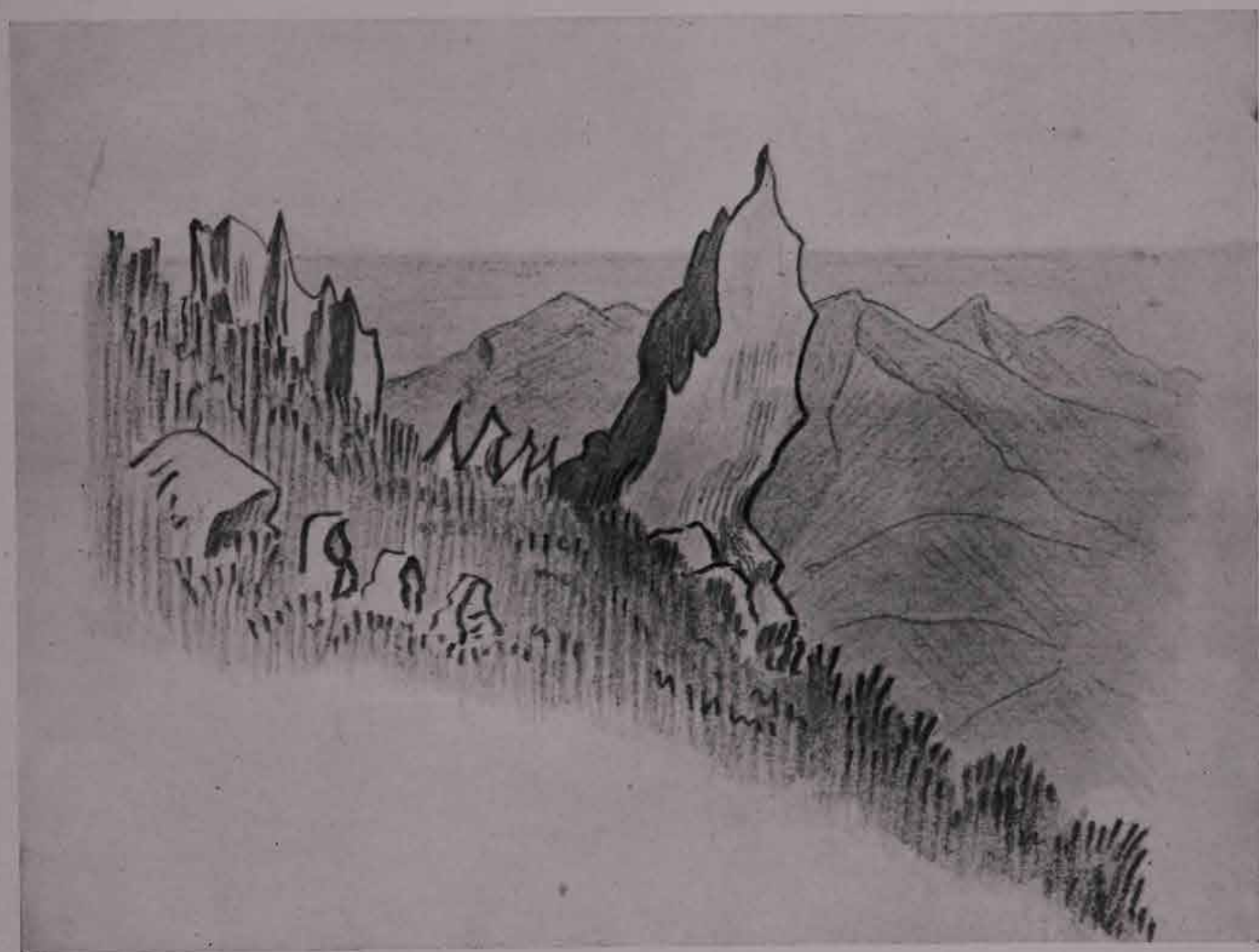
73. Mundo Perdido Trig. from Ossu



74. Looking north of west from Lavatere Trig.



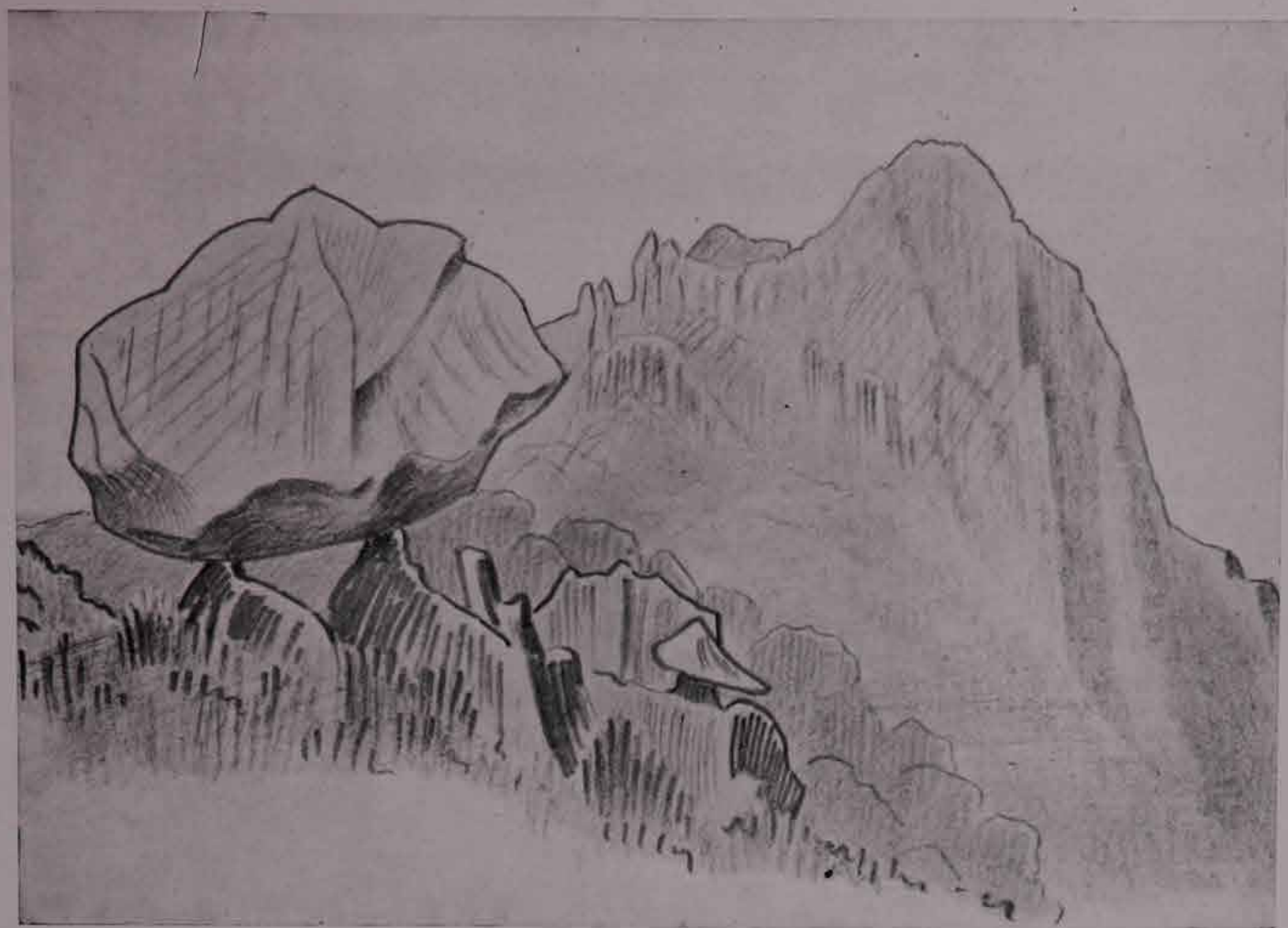
75. Looking west from Mata-Bia (2,315 m.). Central ranges of Sao Domingos.



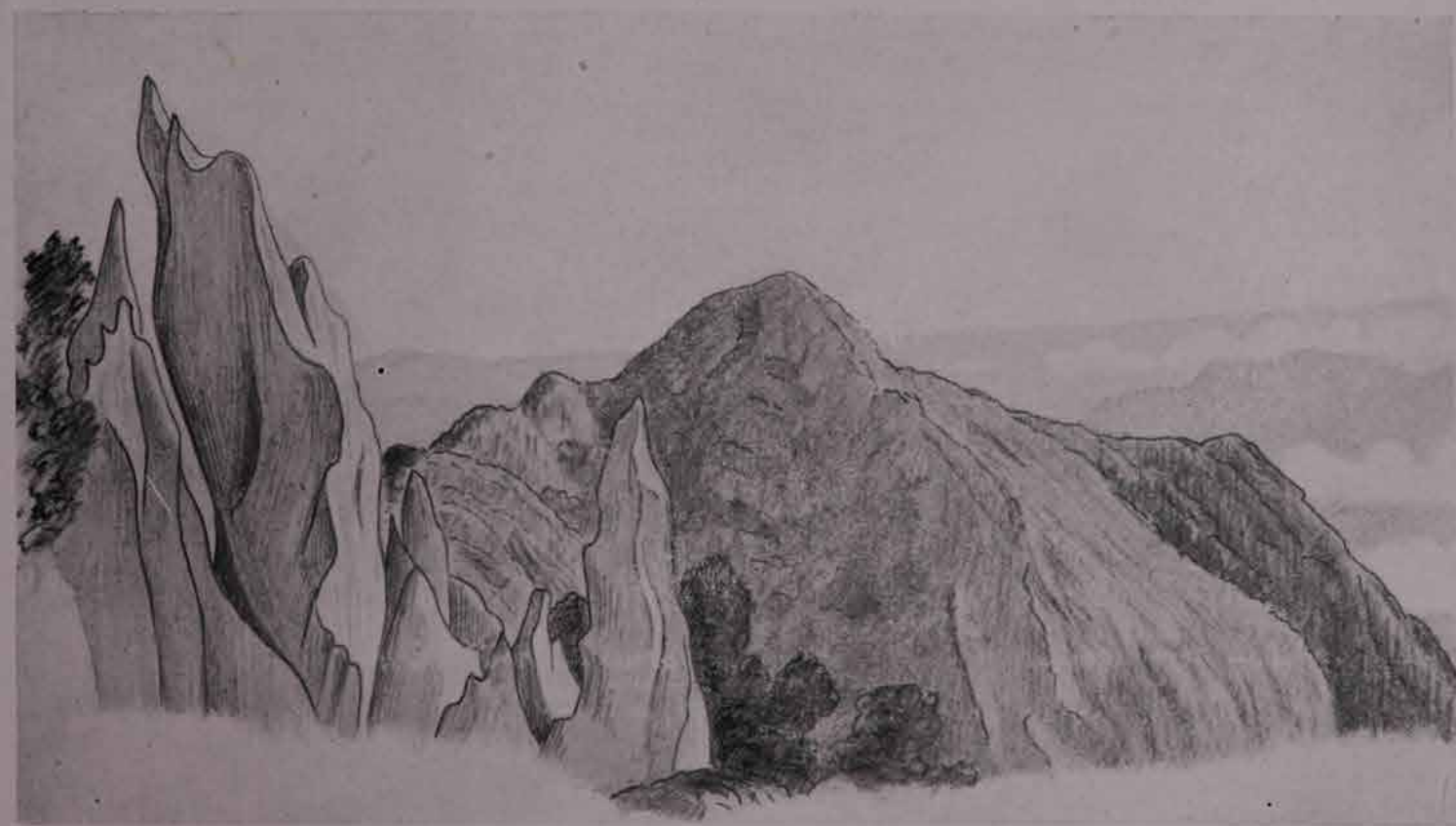
76. Looking south from Mata-Bia



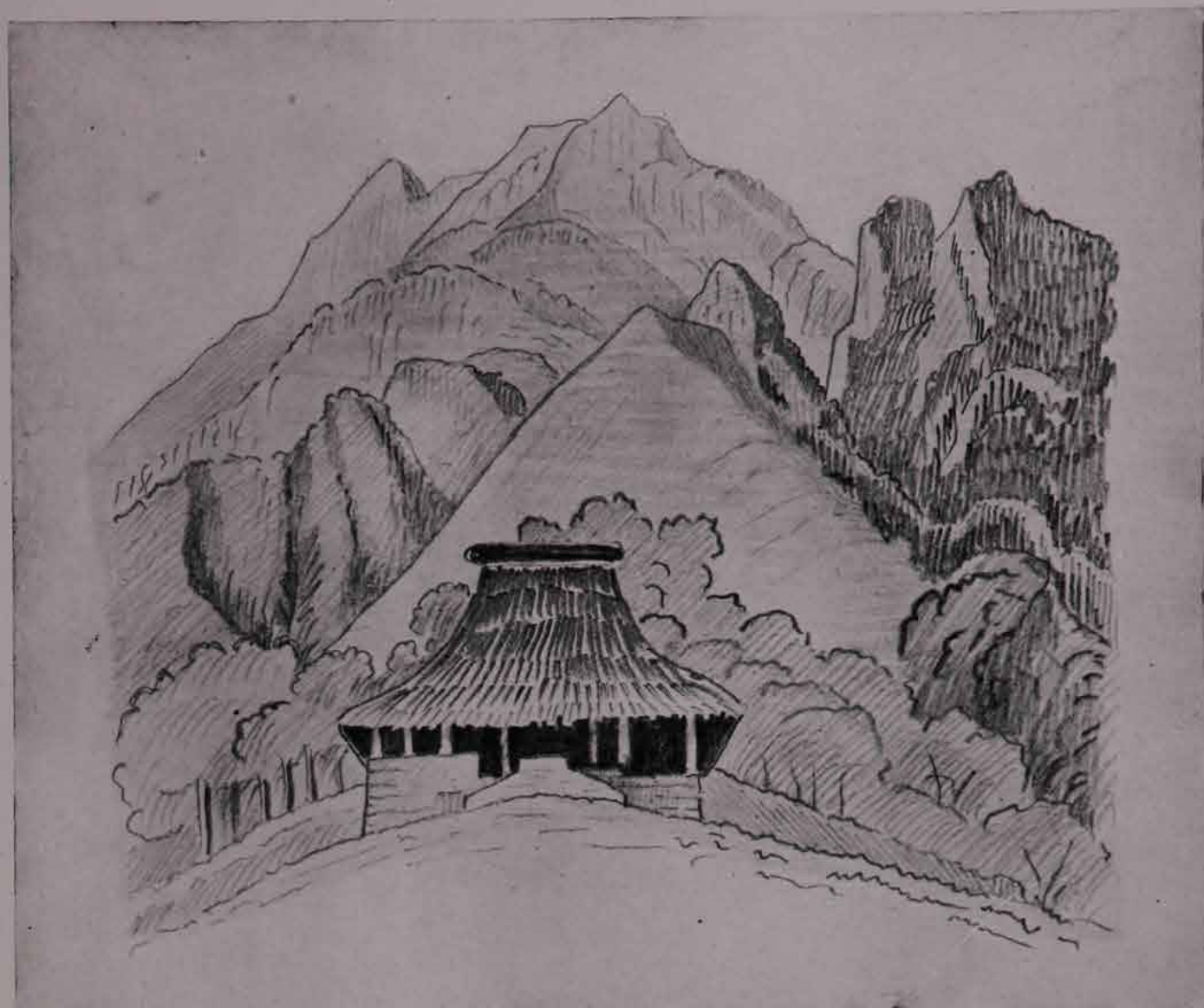
77. Looking east from Mata-Bia towards Lautem Plateau and eastern tip of island



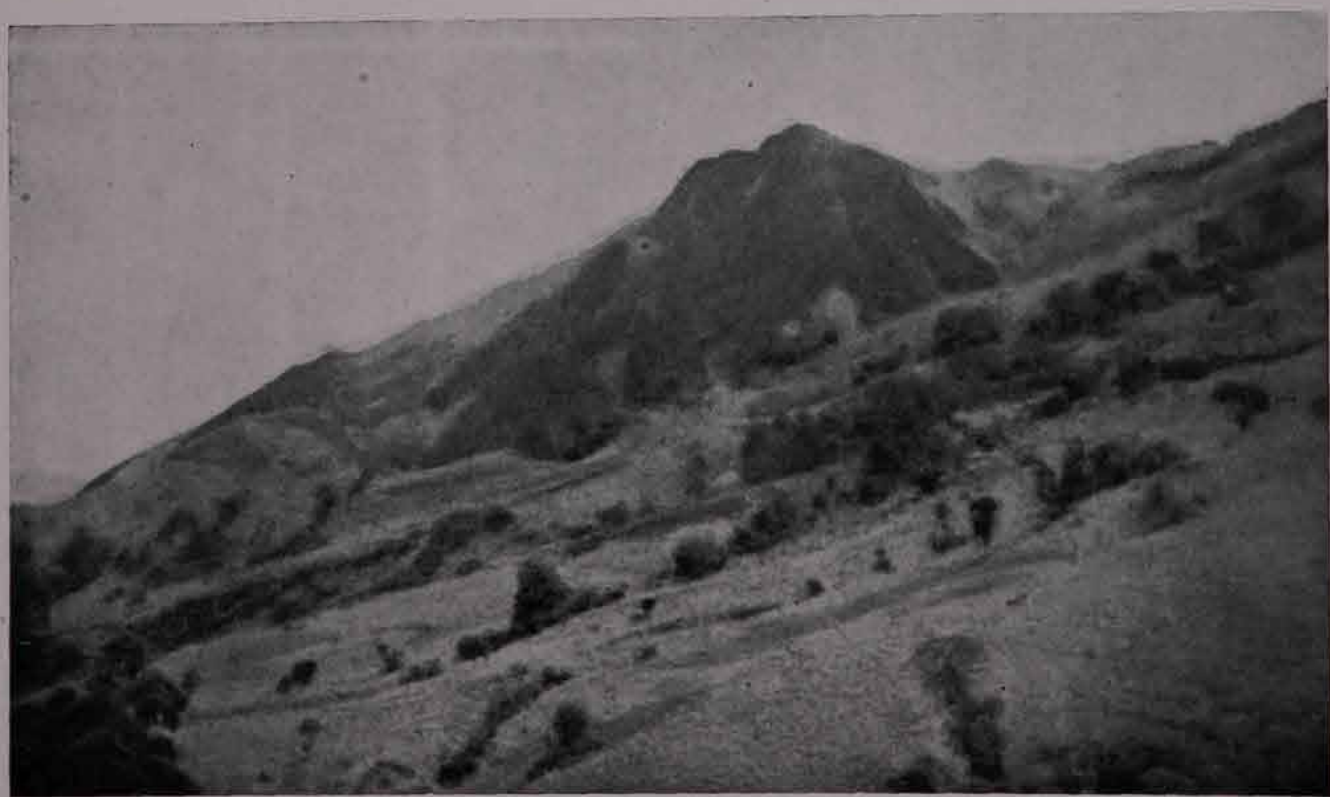
78. Mata-Bia from a high point $1\frac{1}{2}$ miles south



79. Looking southwest from high point $1\frac{1}{2}$ miles south of Mata-Bia



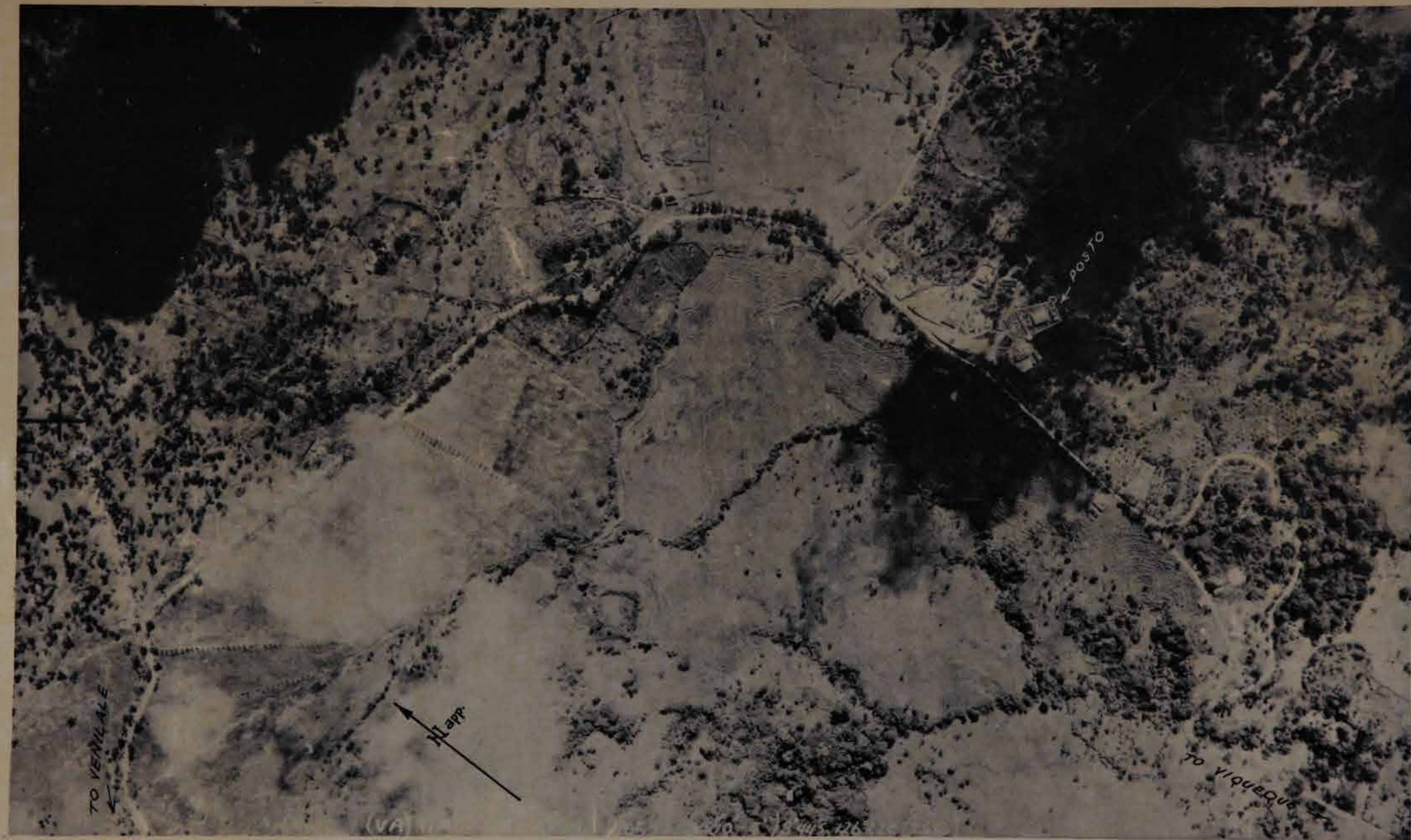
80. Mata-Bia from Ossuna



81. Igneous topography—Peak southwest of Mata-Bia



VA-267 VIQUEQUE 19-9-42 5000' 5" F

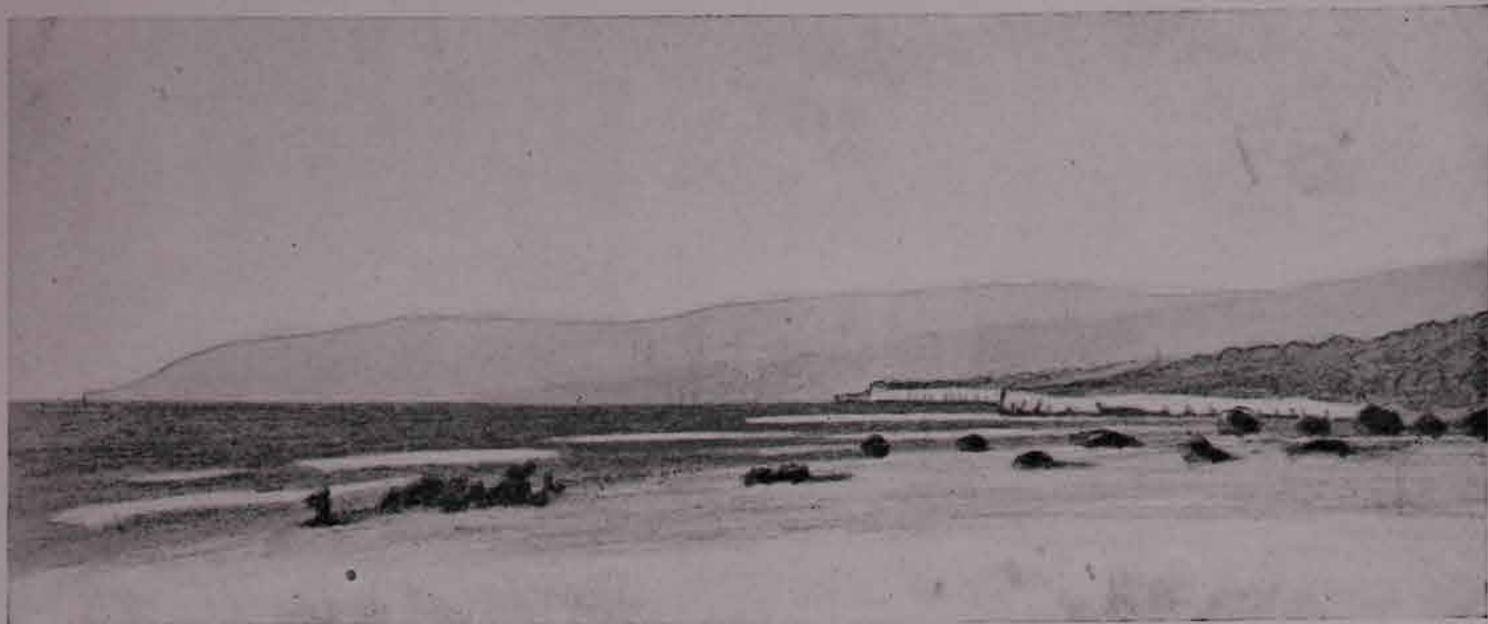




84. Venilale looking northwest (17/11/42)



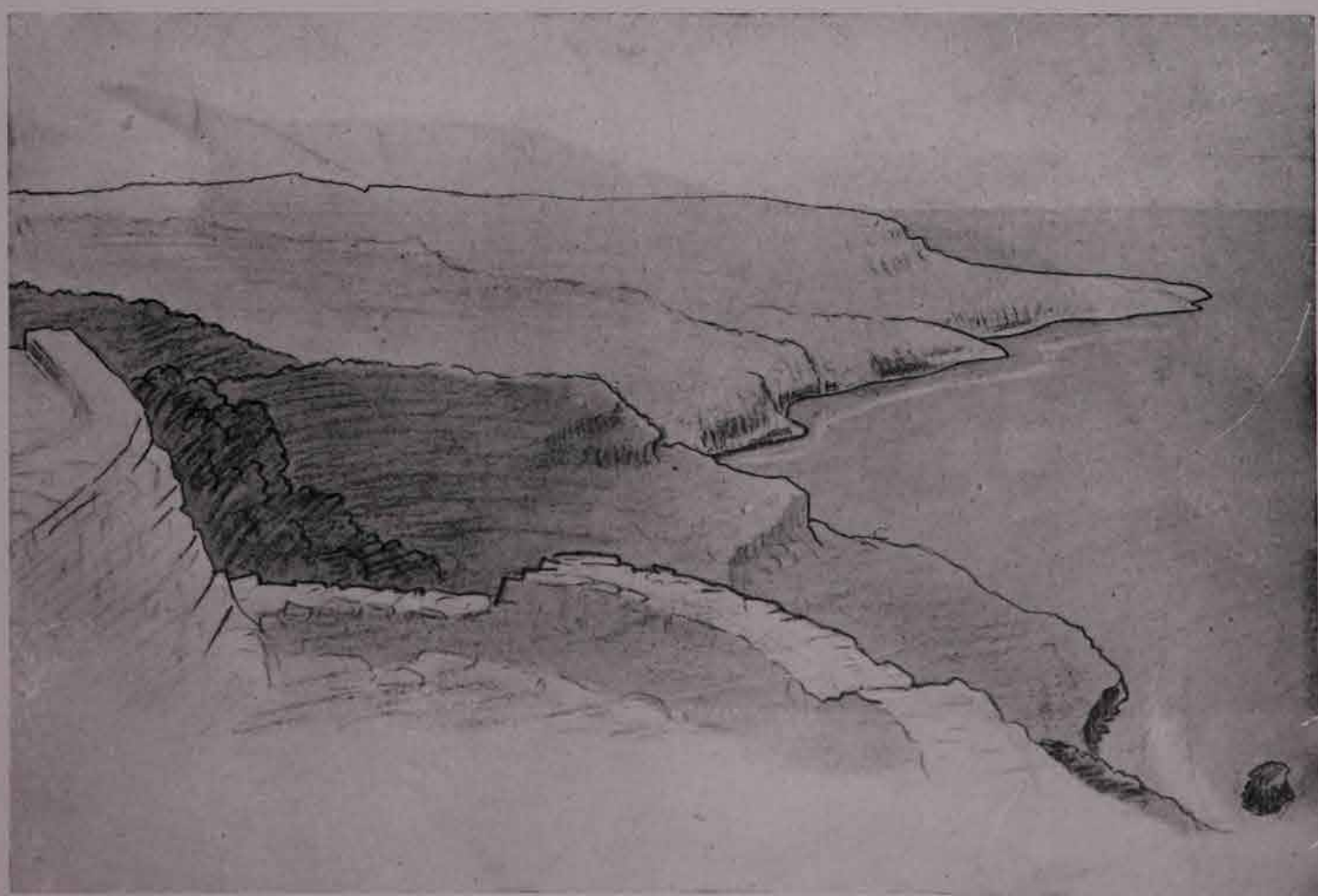
85. Lautem—vertical (14/9/42). (See Map No. 36)



86. Coast looking southeast from Cape Chater

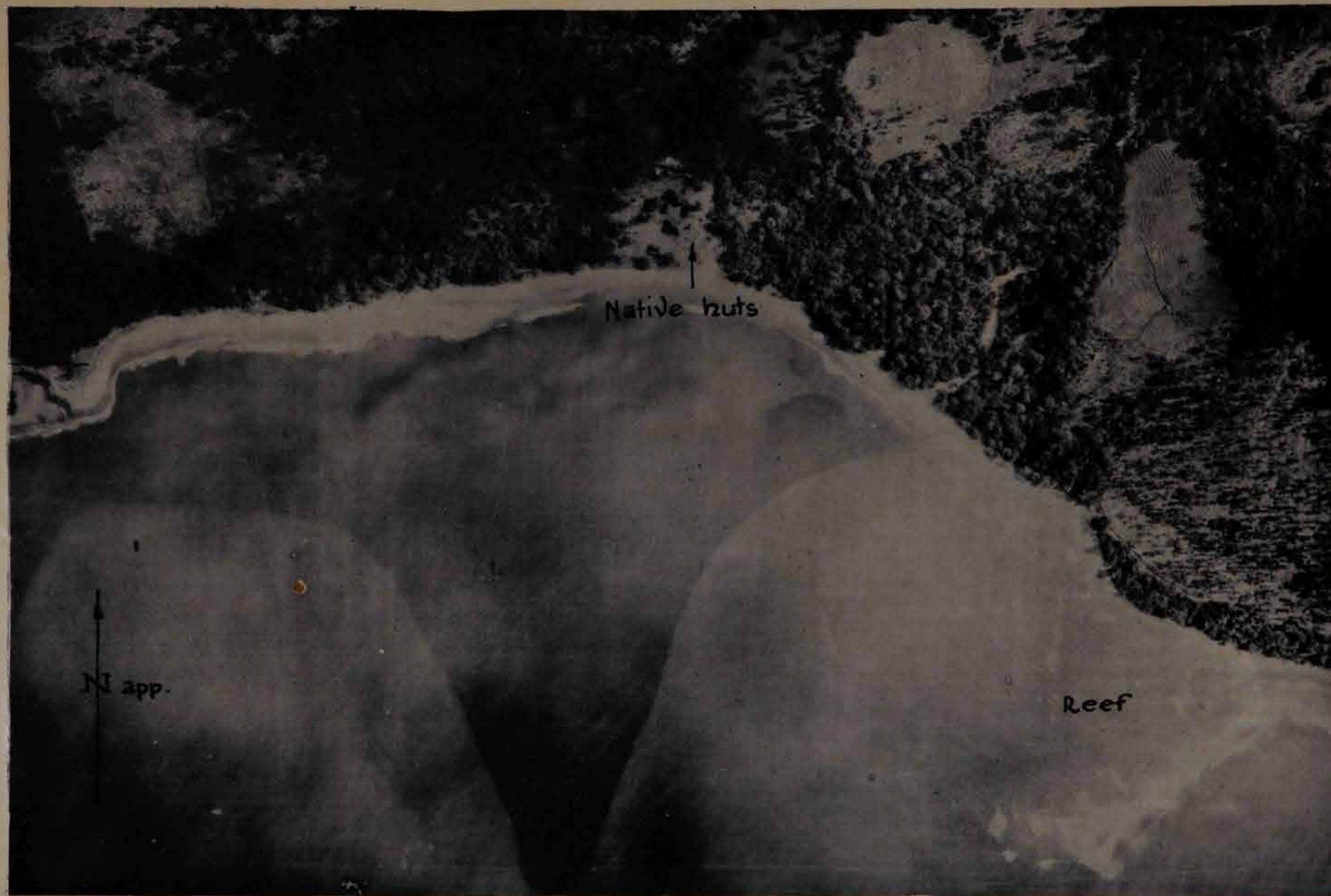


87. Cape Apile looking west. Drawing



88. View of coast looking northwest from Tutuala. Drawing

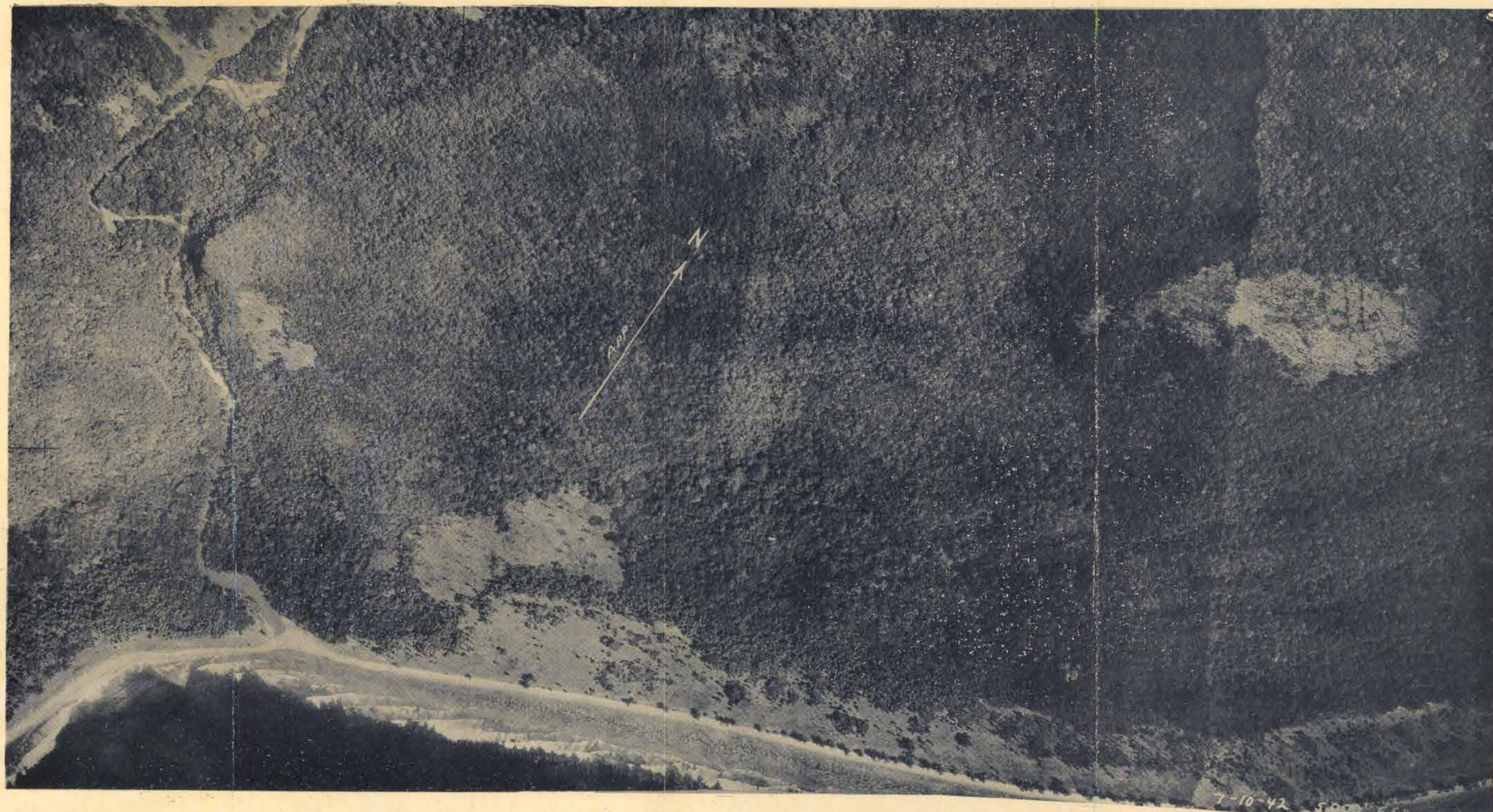




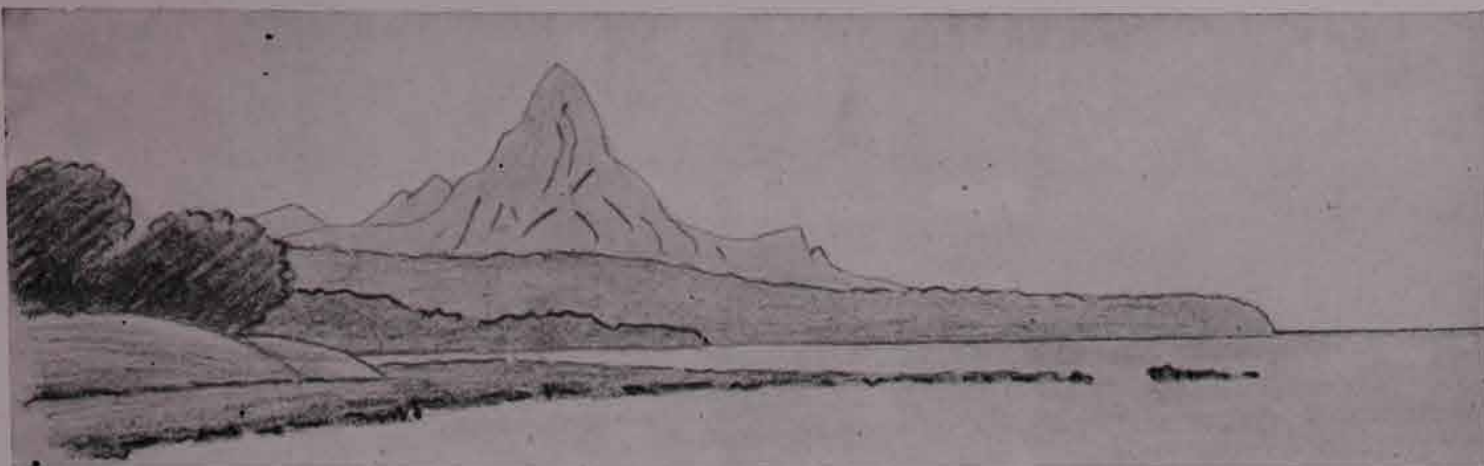
90. Elomar (7/10/42). (See Map No. 28)



91. Saenamo (7/10/42). (See Map No. 32)



92. Mosaic—coast and village of Beru, southern Lautem (7/10/42)—typical limestone country



93. Coast from Cape Loré looking northeast



94. Near Ira-Bin Creek, looking west



95. Mountains between Tutuala and Loré seen from north, across the Lautem Plateau



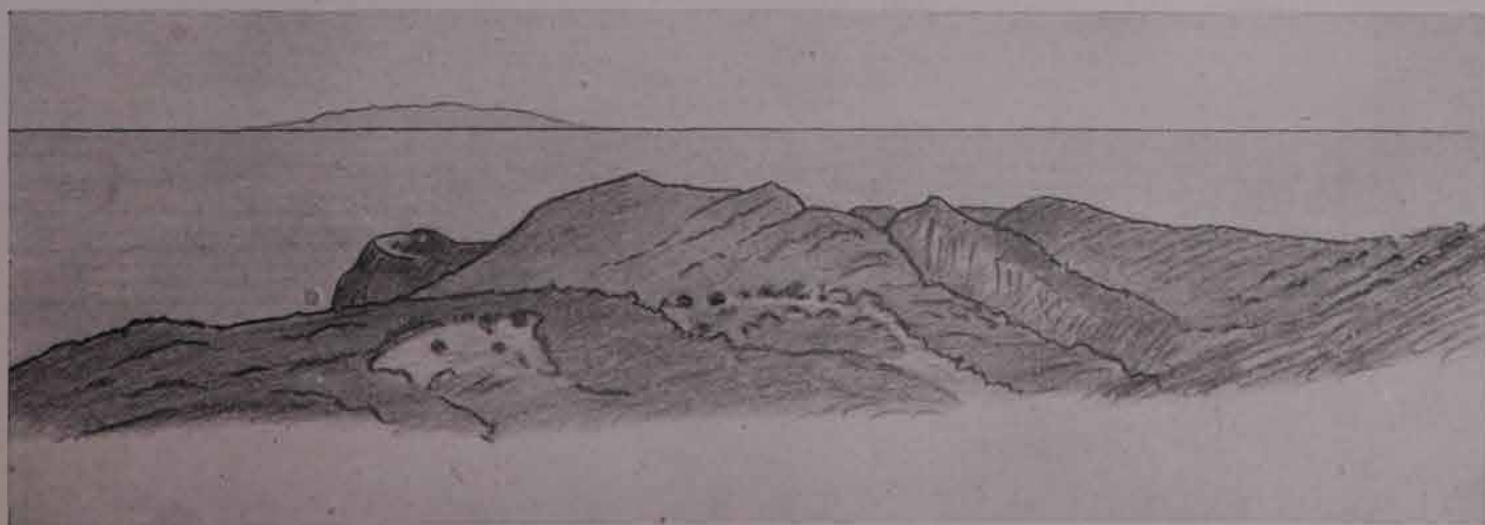
96. View looking southeast (140°) from Poros to Ira-Lalaro (Lake Surubec)



97. Hill 757 (Nelu) from two miles north towards Rusa
(Nelu is the sharp point on the right-hand side)



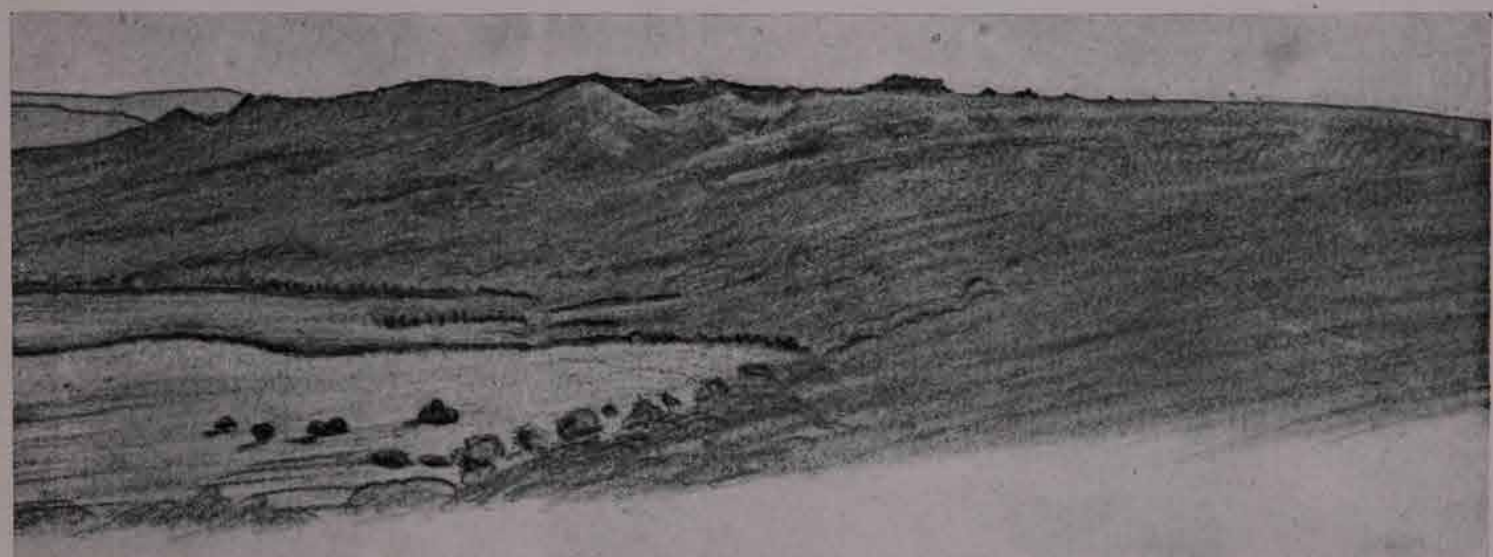
98. Looking southwest from Trig. 435 m.— $2\frac{1}{2}$ miles southeast of Rusa



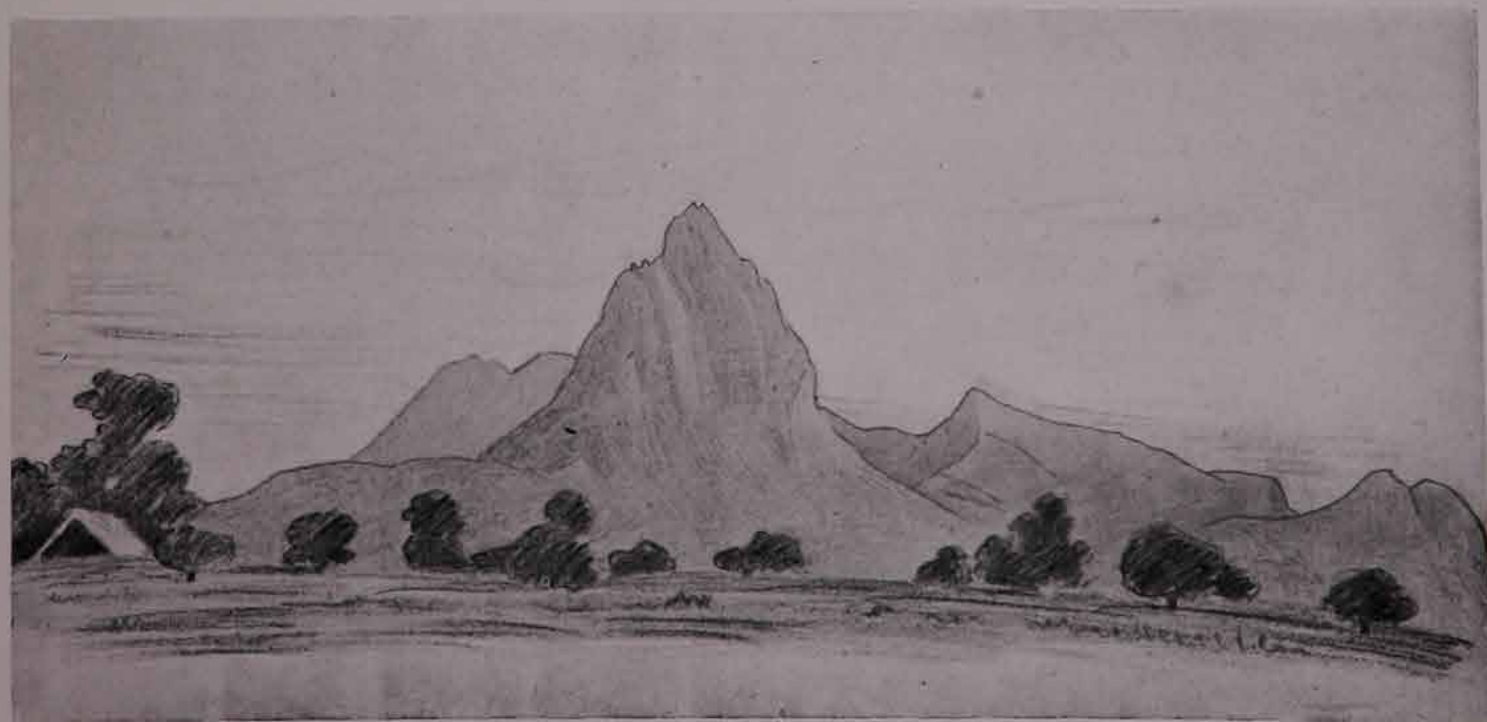
99. Looking east-northeast from Rusa Trig. towards Tutuala and Leti Island



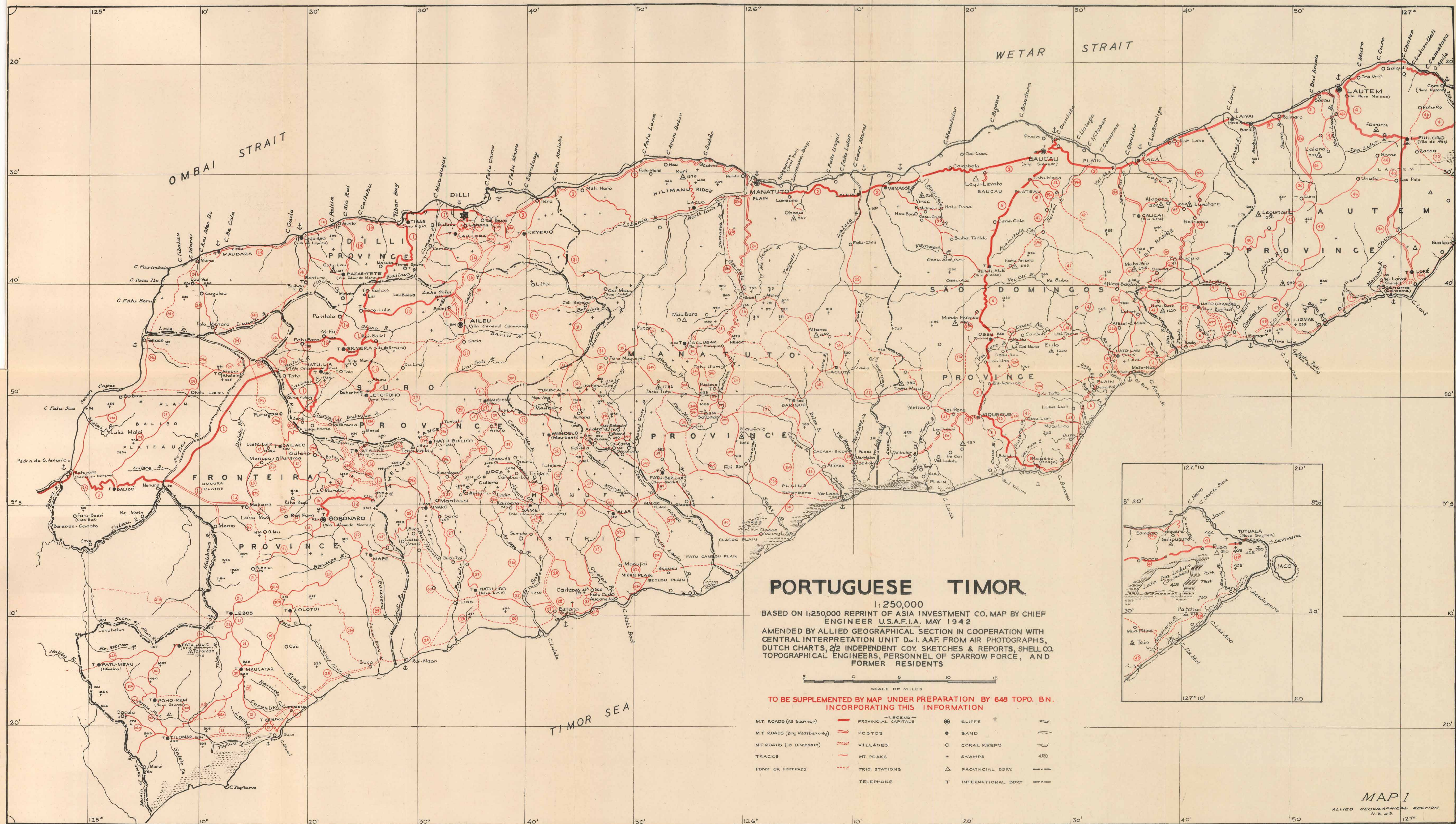
100. Looking south-southwest from Rusa Trig. point



101. From Rusa looking northwest

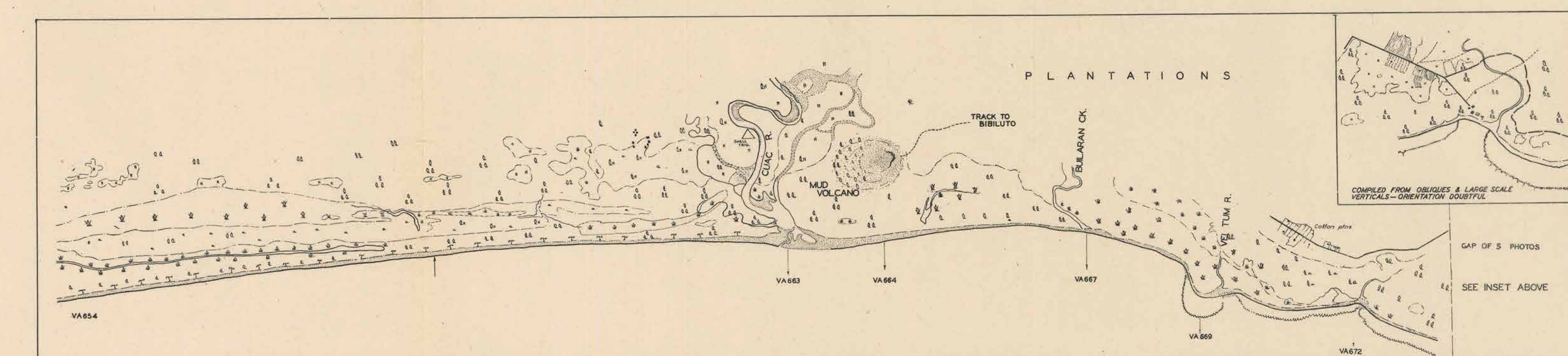
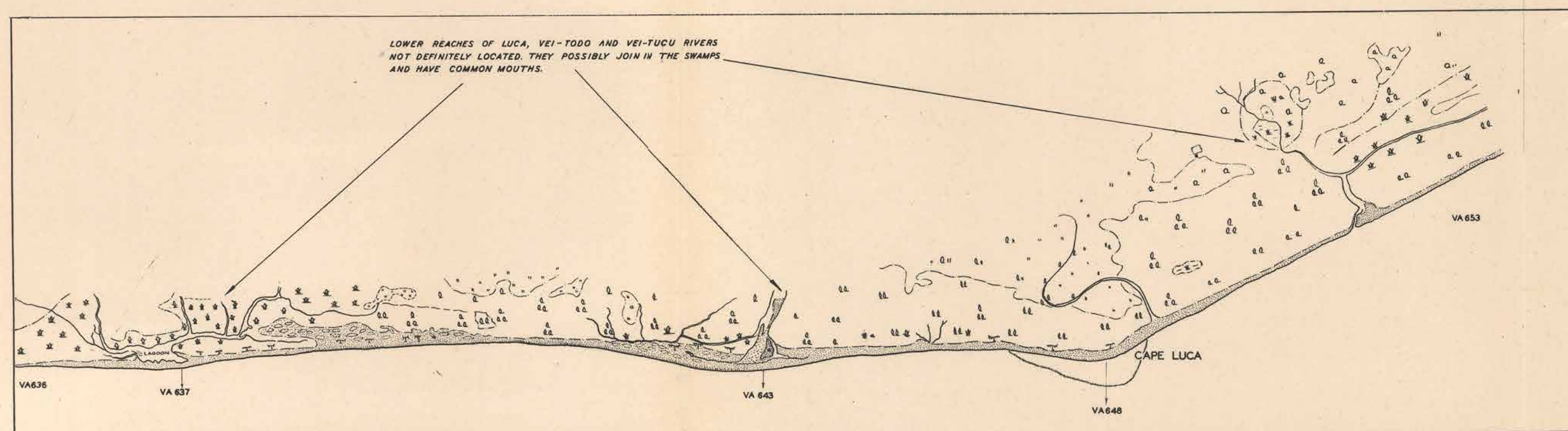
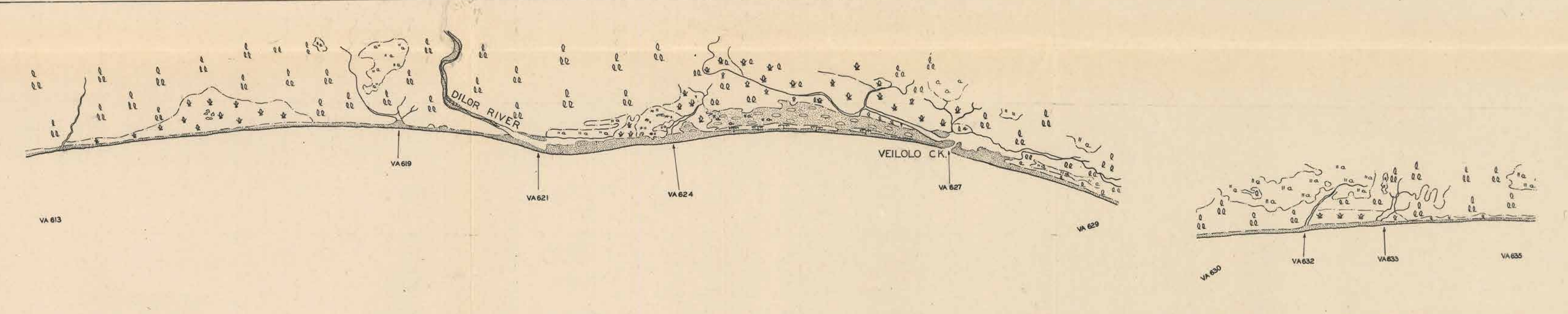
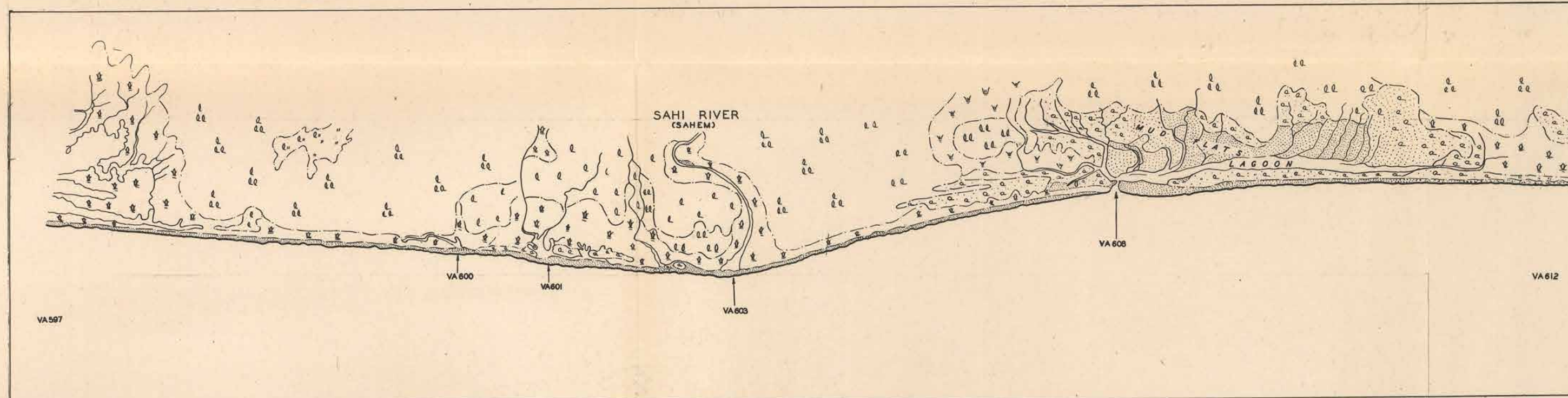
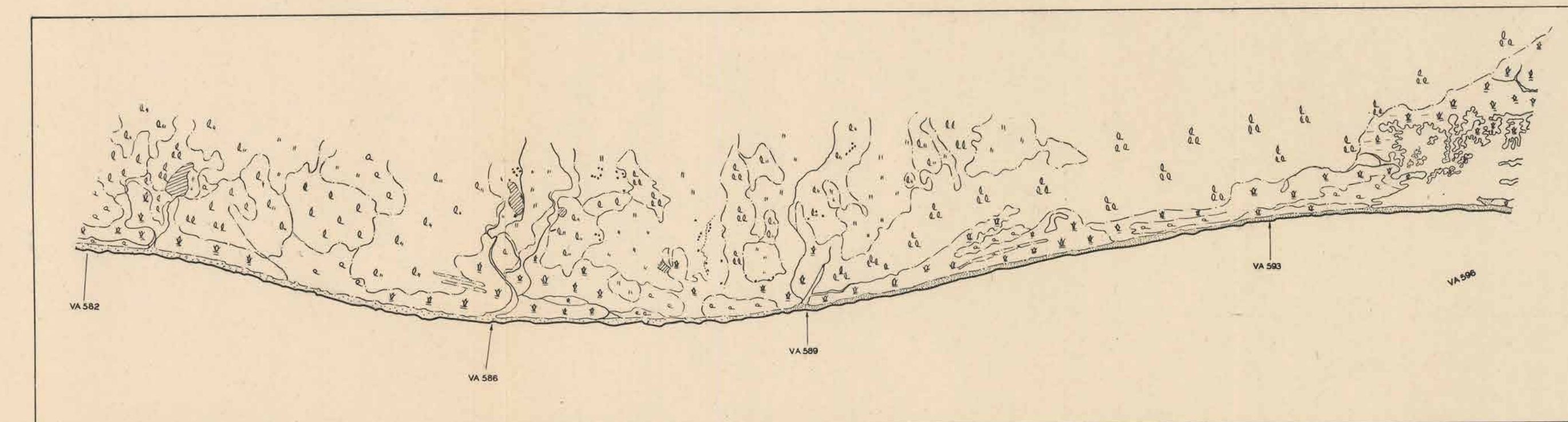
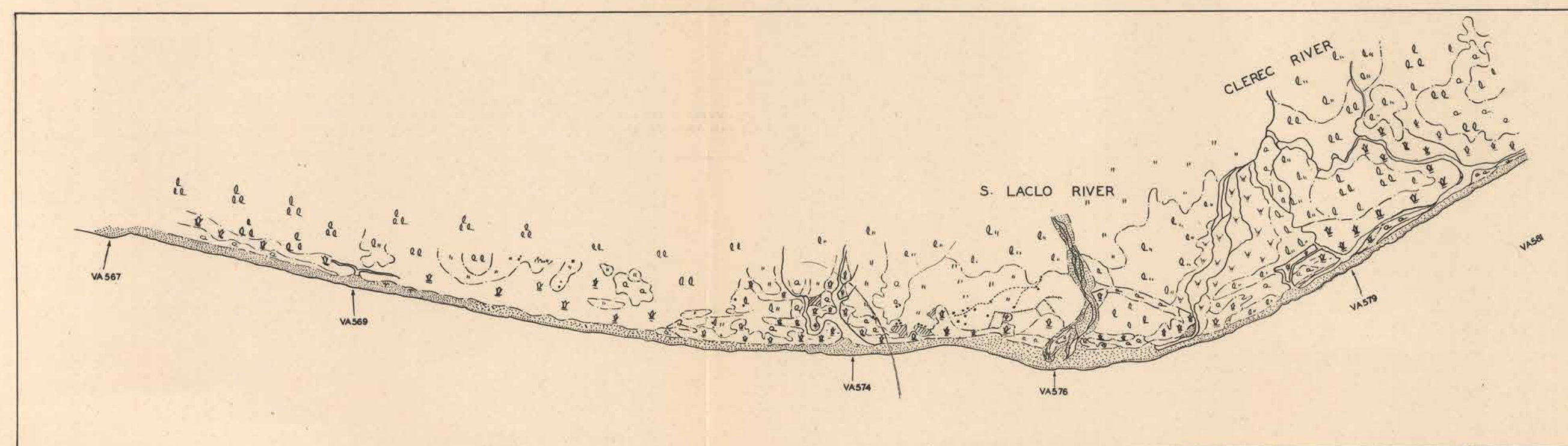
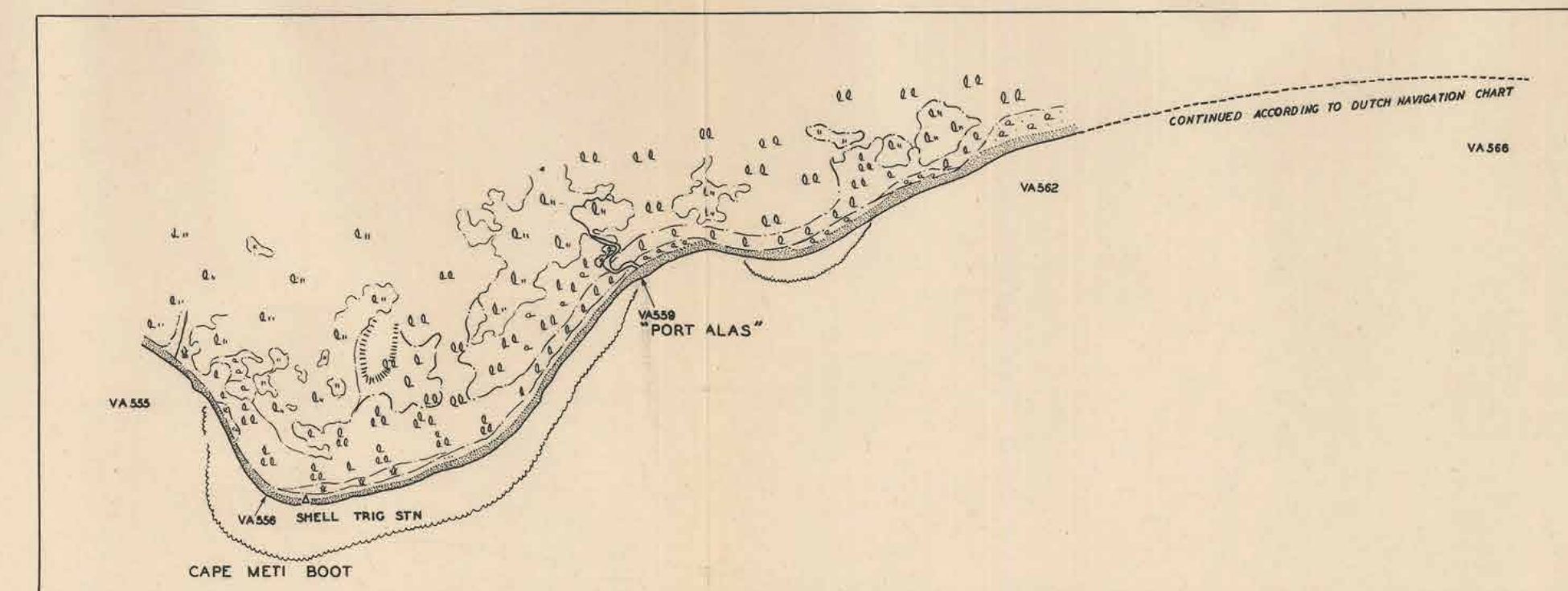
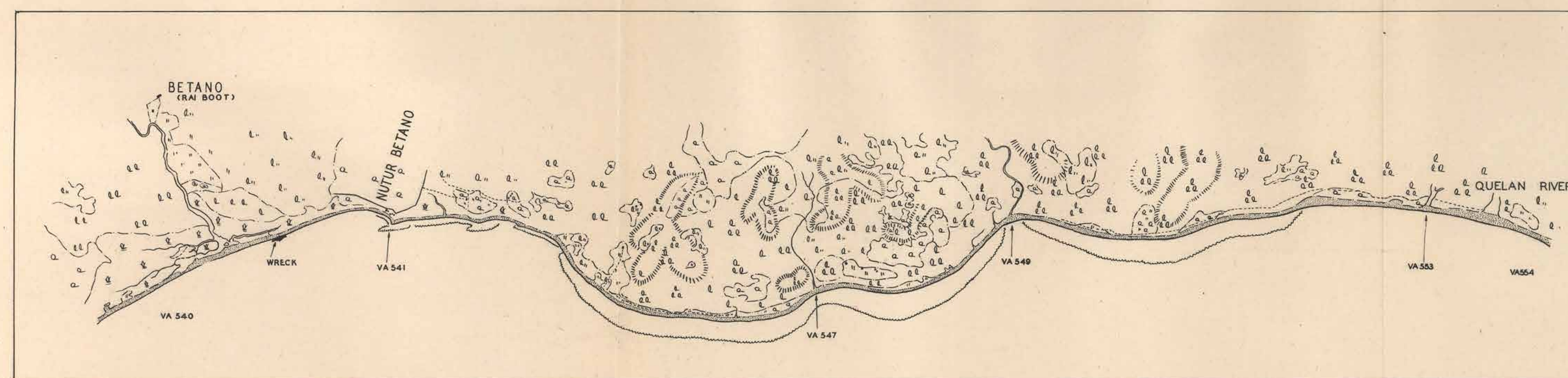


102. Nelu from a point between Rusa and Nelu



PORTUGUESE TIMOR
1:250,000
BASED ON 1:250,000 REPRINT OF ASIA INVESTMENT CO. MAP BY CHIEF
ENGINEER U.S.A.F.I.A. MAY 1942
AMENDED BY ALLIED GEOGRAPHICAL SECTION IN COOPERATION WITH
CENTRAL INTERPRETATION UNIT D.I. AAF. FROM AIR PHOTOGRAPHS,
DUTCH CHARTS, 2/2 INDEPENDENT COY. SKETCHES & REPORTS, SHELL CO.
TOPOGRAPHICAL ENGINEERS, PERSONNEL OF SPARROW FORCE, AND
FORMER RESIDENTS

- TO BE SUPPLEMENTED BY MAP UNDER PREPARATION BY 648 TOPO. BN.
INCORPORATING THIS INFORMATION
- | | | |
|-------------------------------|---------------------|---------------------|
| M.T. ROADS (All Weather) | PROVINCIAL CAPITALS | CLIFFS |
| M.T. ROADS (Dry Weather only) | POSTOS | SAND |
| M.T. ROADS (In Disrepair) | VILLAGES | CORAL REEFS |
| TRACKS | MT. PEAKS | SWAMPS |
| PONY OR FOOTPADS | TRIG STATIONS | PROVINCIAL BDRY. |
| | TELEPHONE | INTERNATIONAL BDRY. |

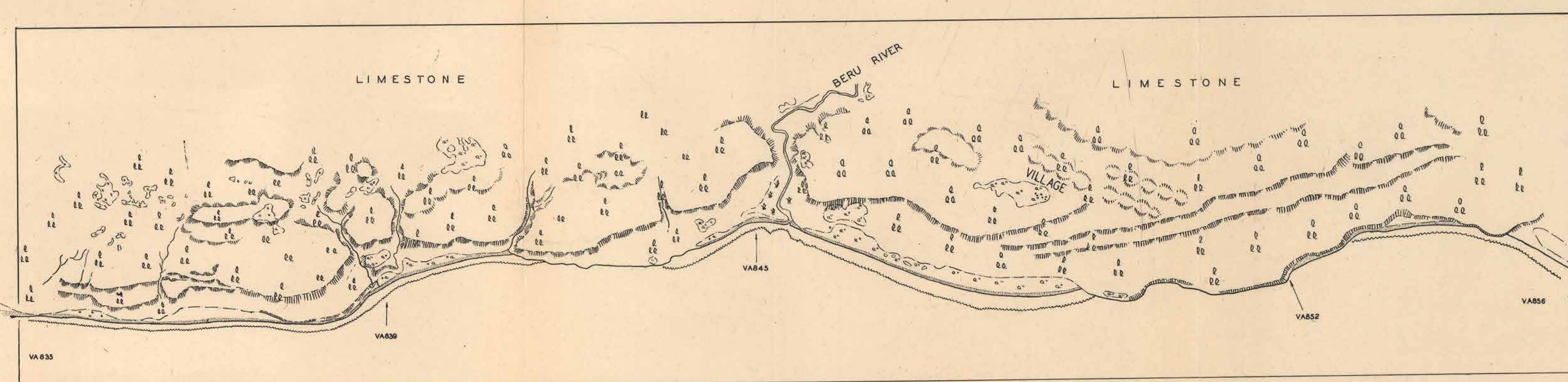
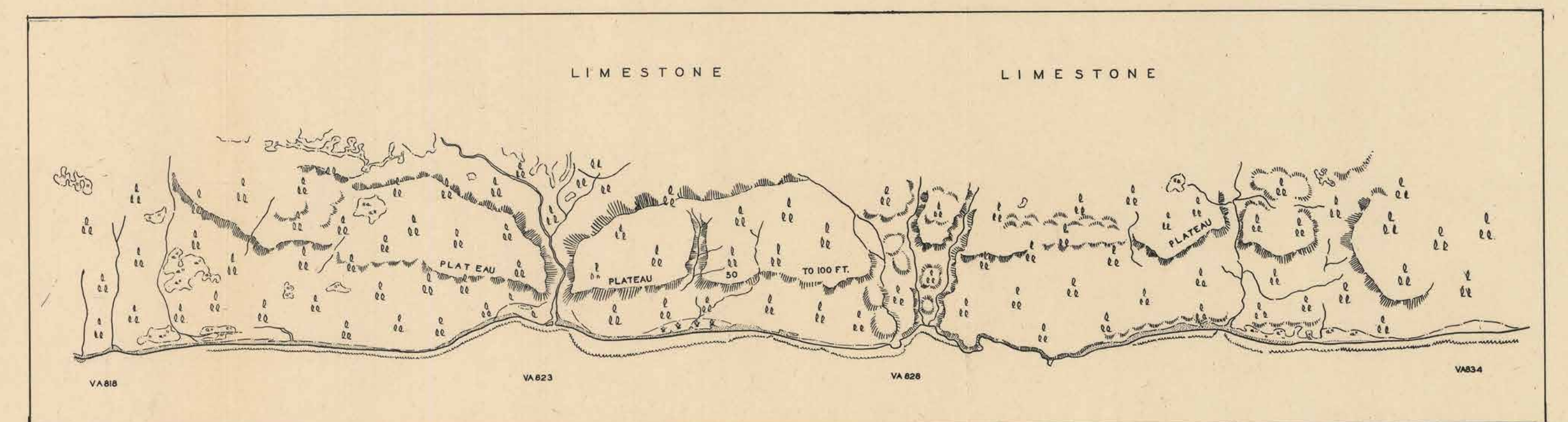
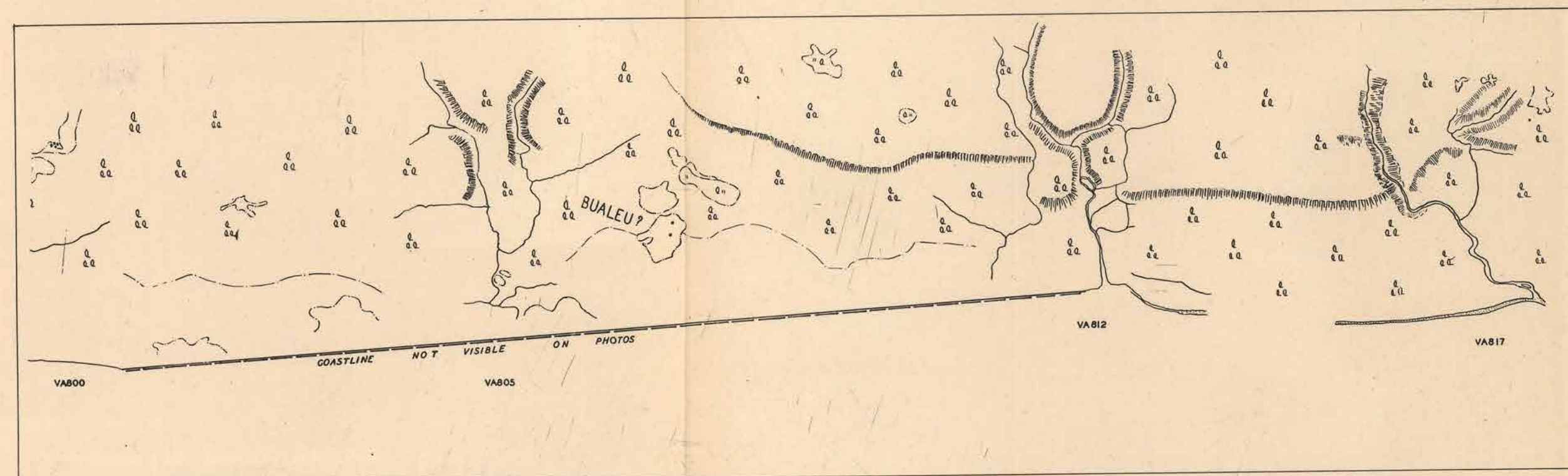
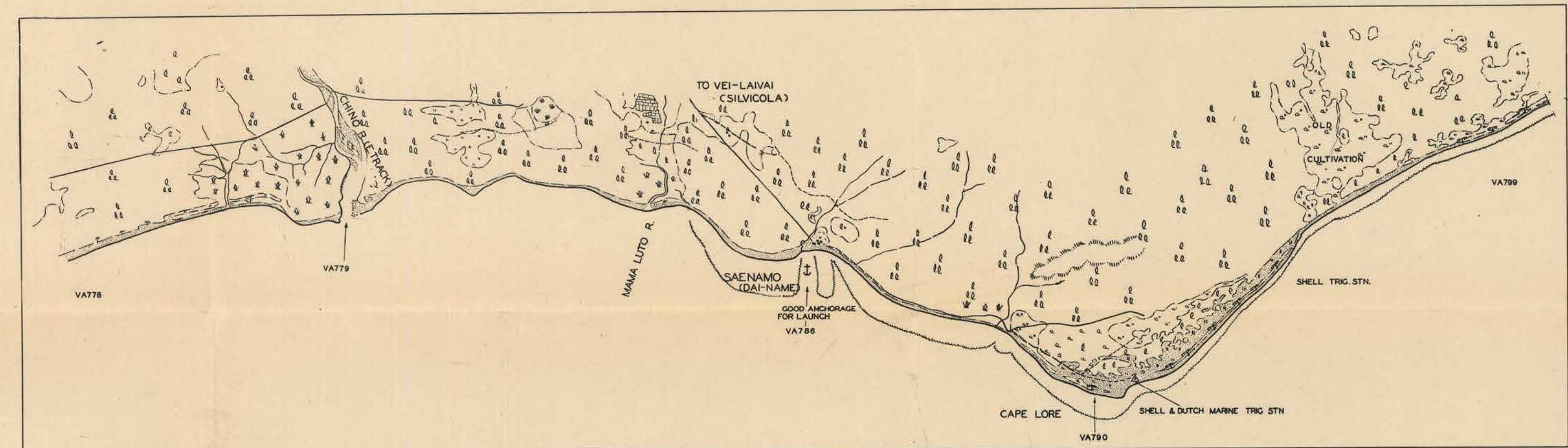
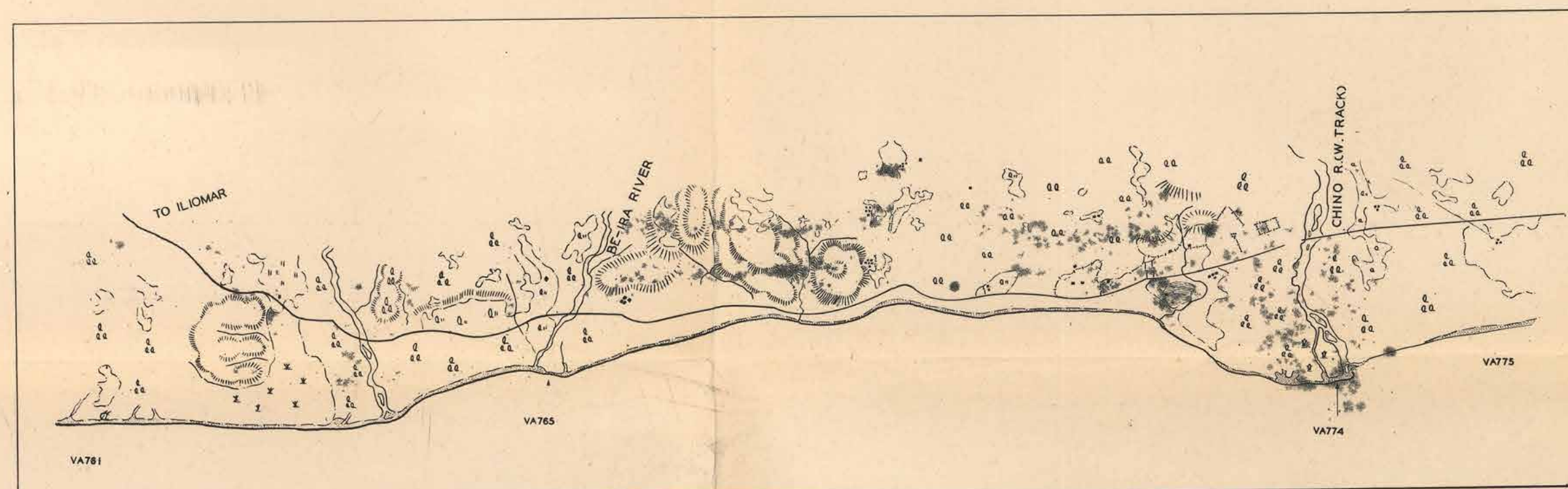
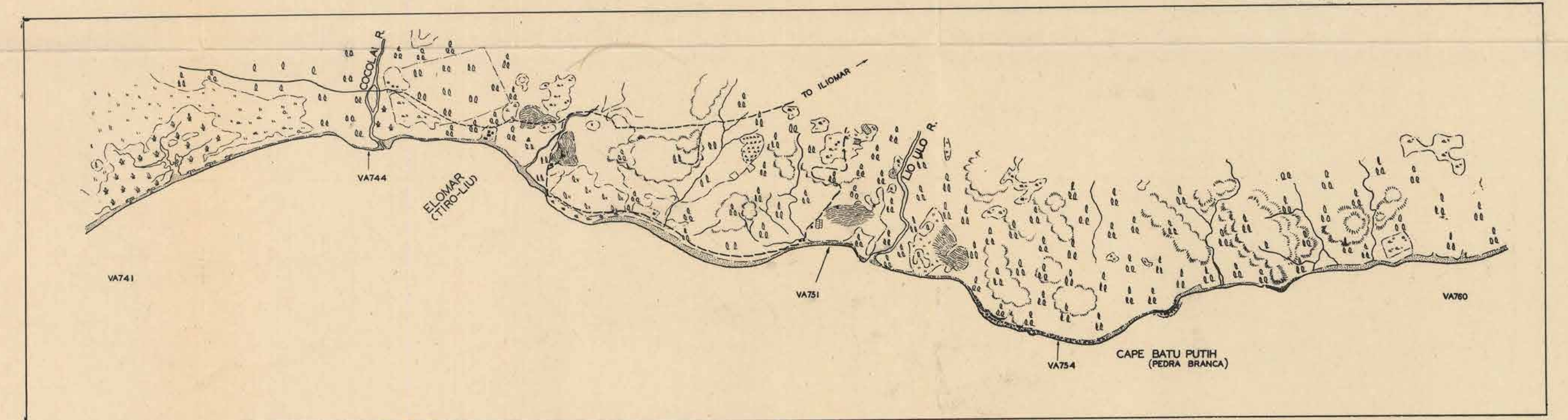
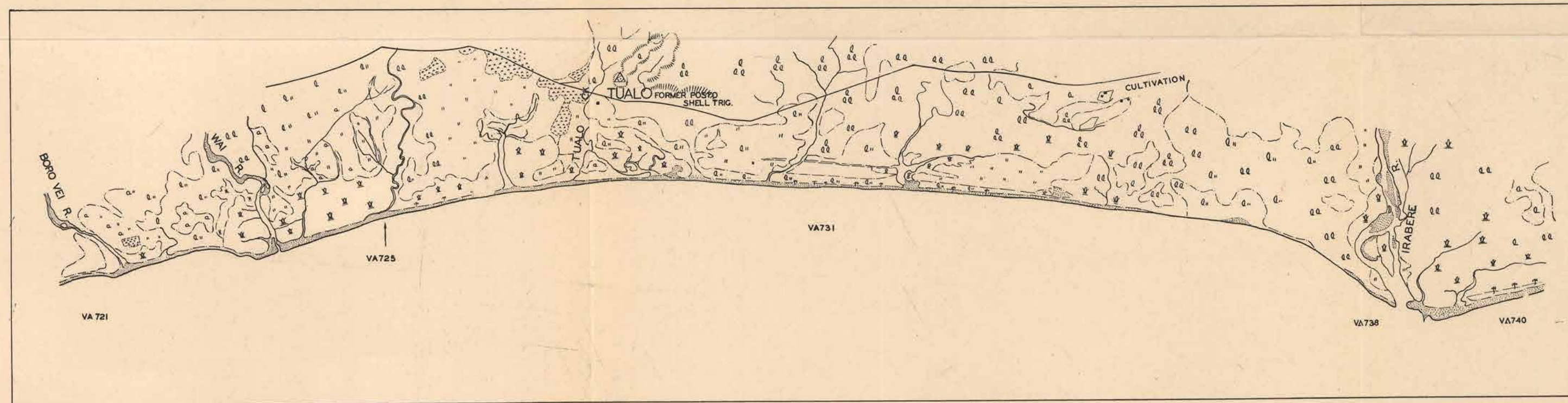
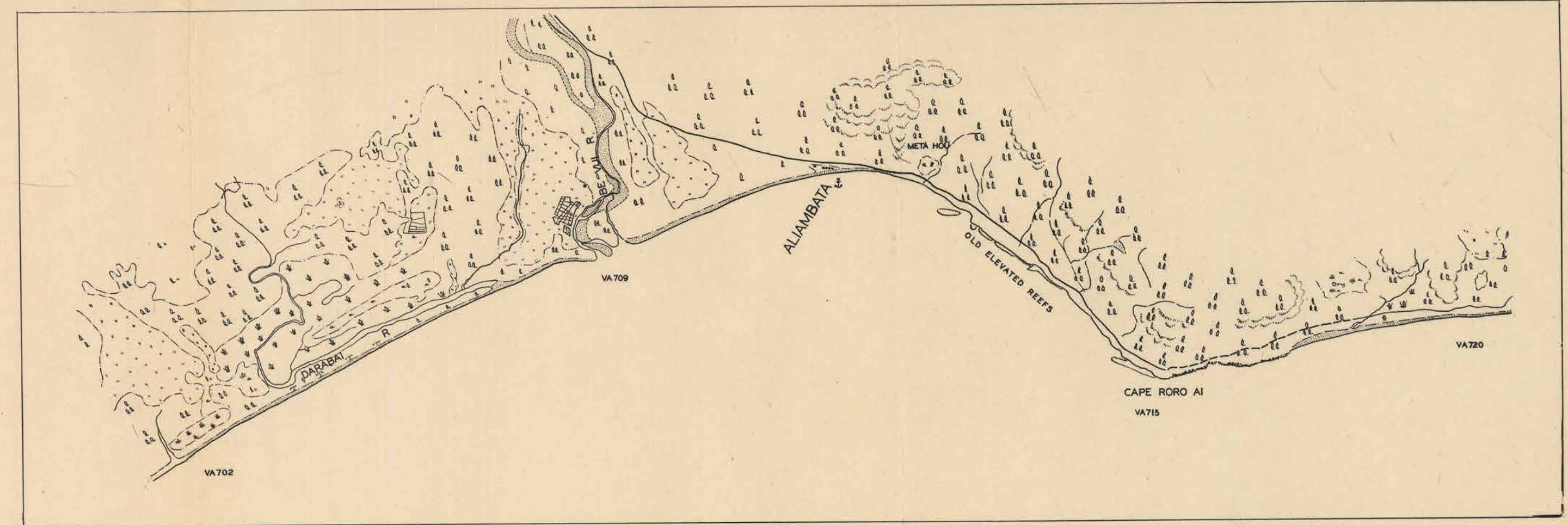
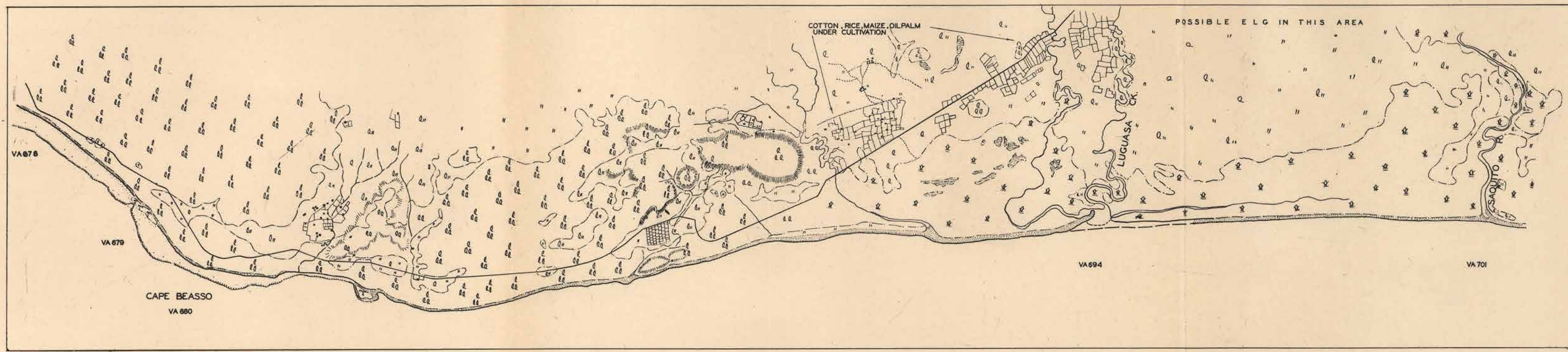


LEGEND

ROADS	CLIFFS	
TRAILS	CORAL REEF	
VILLAGES	SAND	
RAIN FOREST	CASUARINAS	
MEDIUM TIMBER	COCONUT PLANTATION	
LIGHT TIMBER	GRASSLAND	
SAVANNAH	FENCES	
OPEN SWAMP	TRNG. STATIONS	
MANGROVE SWAMP	HILL FEATURES	
TIMBERED SWAMP	ANCHORAGES	
TIMBER BOUNDARIES		

COASTAL STRIP MAP
BETANO TO NEAR C. JACO
FROM UNCONTROLLED VERTICAL
PHOTOGRAPHS

ANNOTATIONS BY ALLIED GEOGRAPHICAL SECTION & CENTRAL
INTERPRETATION UNIT D-1. AAF.
JAPANESE COLOR BY TANKS
ALLIED GEOGRAPHICAL SECTION



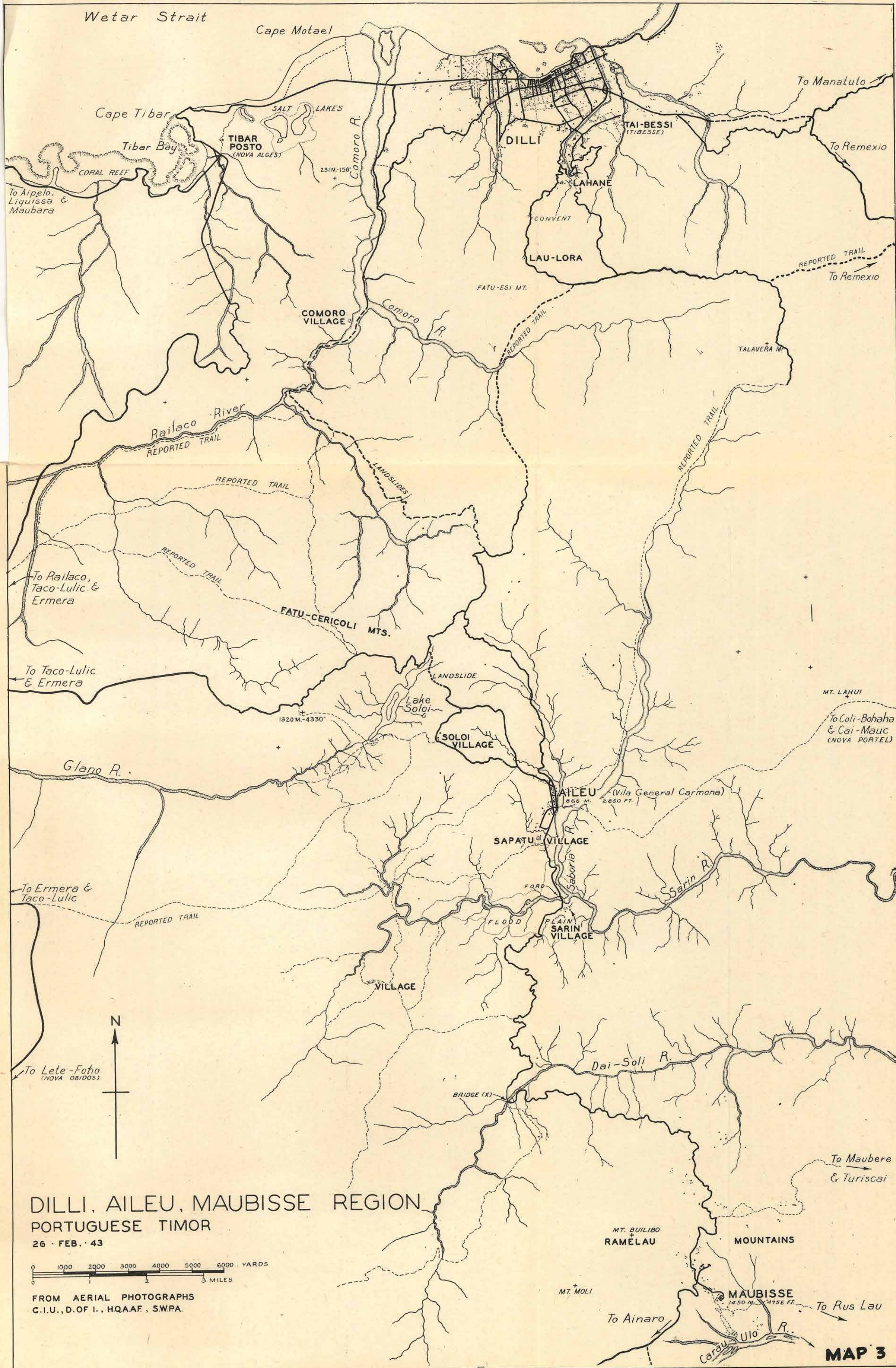
LEGEND

ROADS	CLIFFS
TRACKS	CORAL REEF
VILLAGES	SAND
RAIN FOREST	CASUARINAS
MEDIUM TIMBER	COCONUT PLANTATION
LIGHT TIMBER	GRASSLAND
SANITARY	FENCES
OPEN SWAMP	TRIG STATIONS
MANGROVE SWAMP	HILL FEATURES
TIMBER BOUNDARIES	ANCHORAGES

COASTAL STRIP MAP
BETANO TO NEAR C. JACO
FROM UNCONTROLLED VERTICAL
PHOTOGRAPHS

ANNOTATIONS BY ALLIED GEOGRAPHICAL SECTION & CENTRAL
INTERPRETATION UNIT D.L. A.A.P.
APPROX SCALE IN METERS
1:100,000

MAP N°2A



DILLI, AILEU, MAUBISSE REGION
PORTUGUESE TIMOR

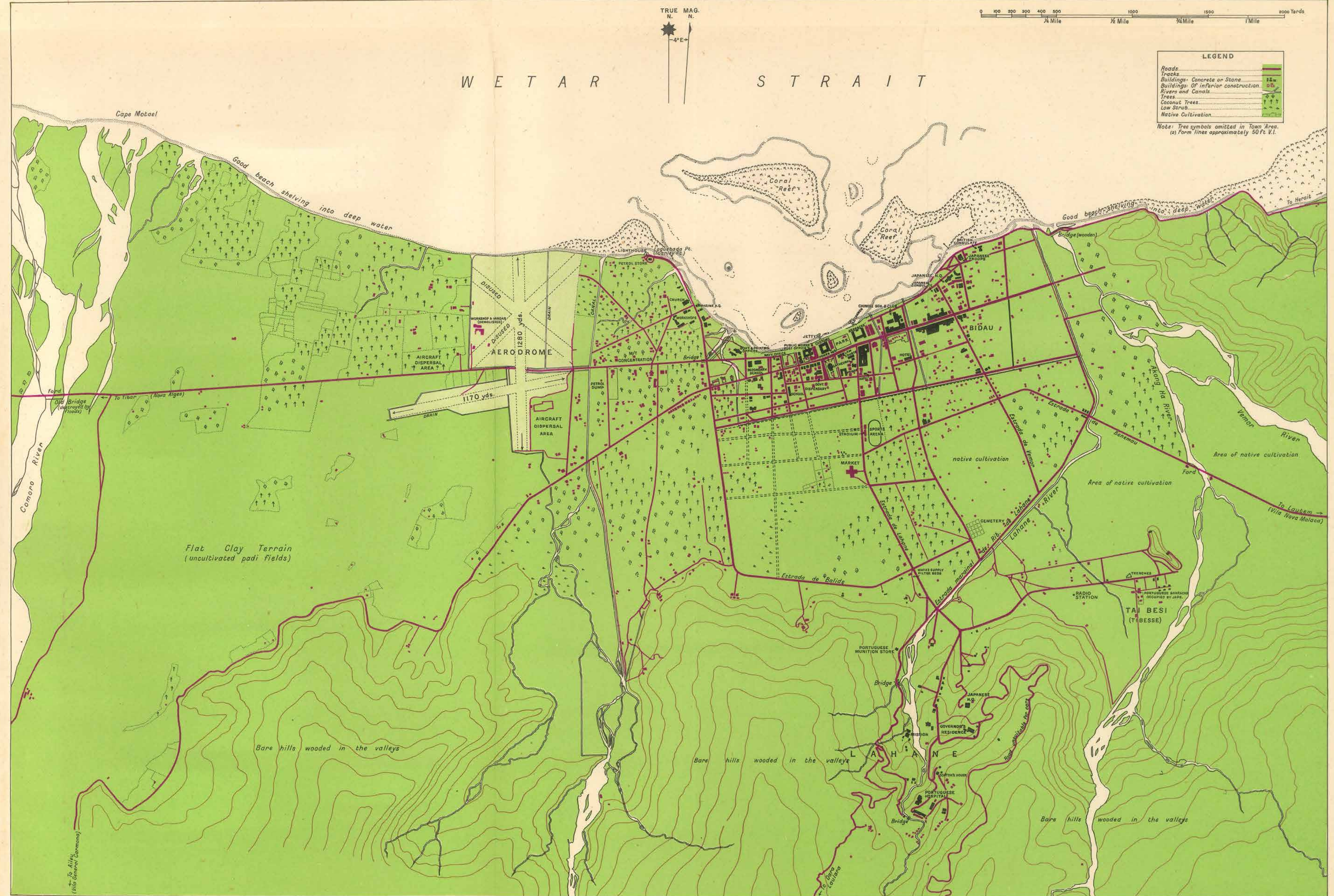
26 FEB. 43

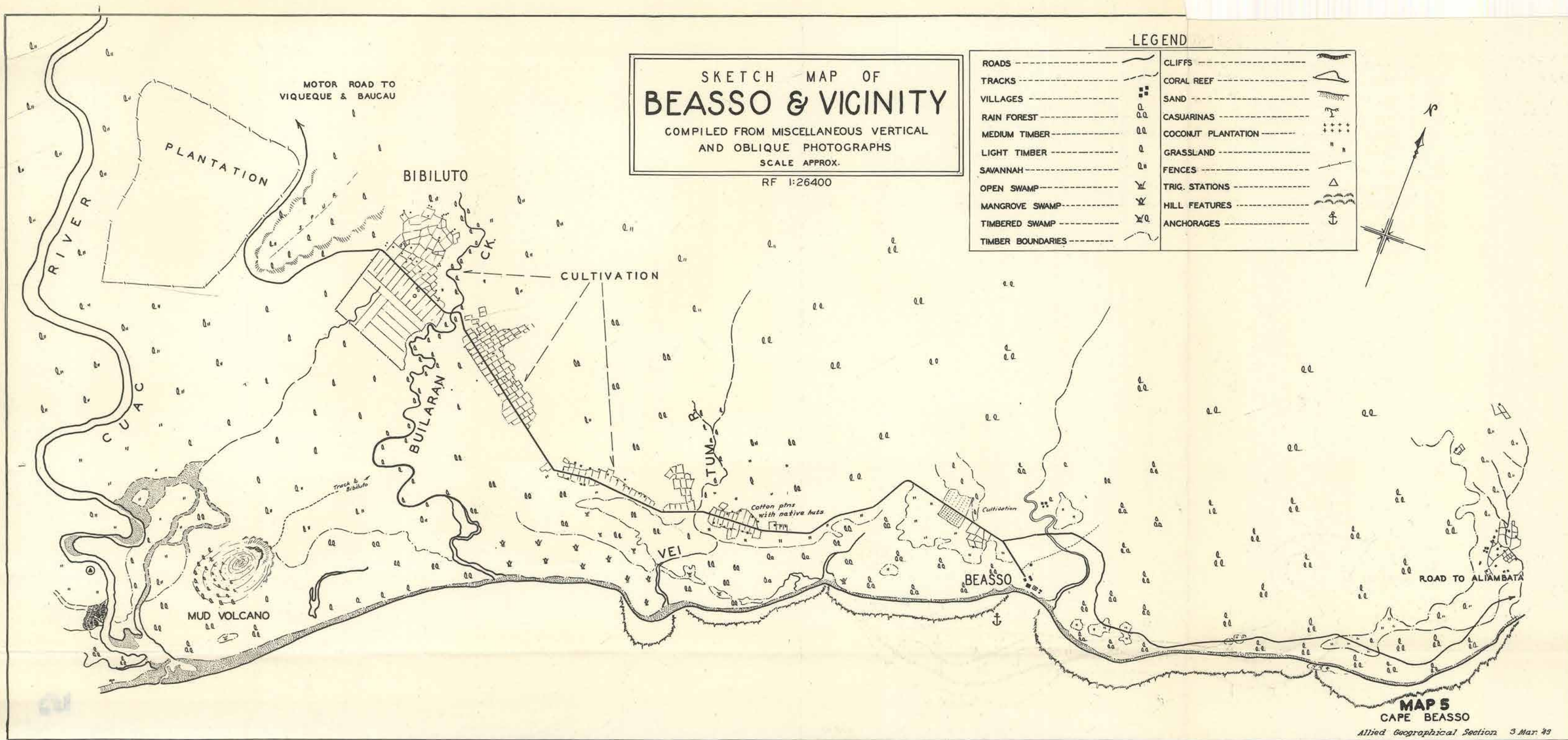
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0 1 2 3 MILES

FROM AERIAL PHOTOGRAPHS
C.I.U., D.O.F.I., HQAAF, SWPA.

MAP 3

Produced by D.of I. A.A.F. S.W.P.A. on 18.11.42
from vertical photographs. Soundings from
Admiralty Chart N° 3440. Scale 1:10,560 Approx.





SKETCH MAP OF BEASSO & VICINITY

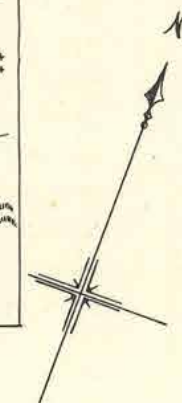
COMPILED FROM MISCELLANEOUS VERTICAL
AND OBLIQUE PHOTOGRAPHS

SCALE APPROX.

RF 1:26400

LEGEND

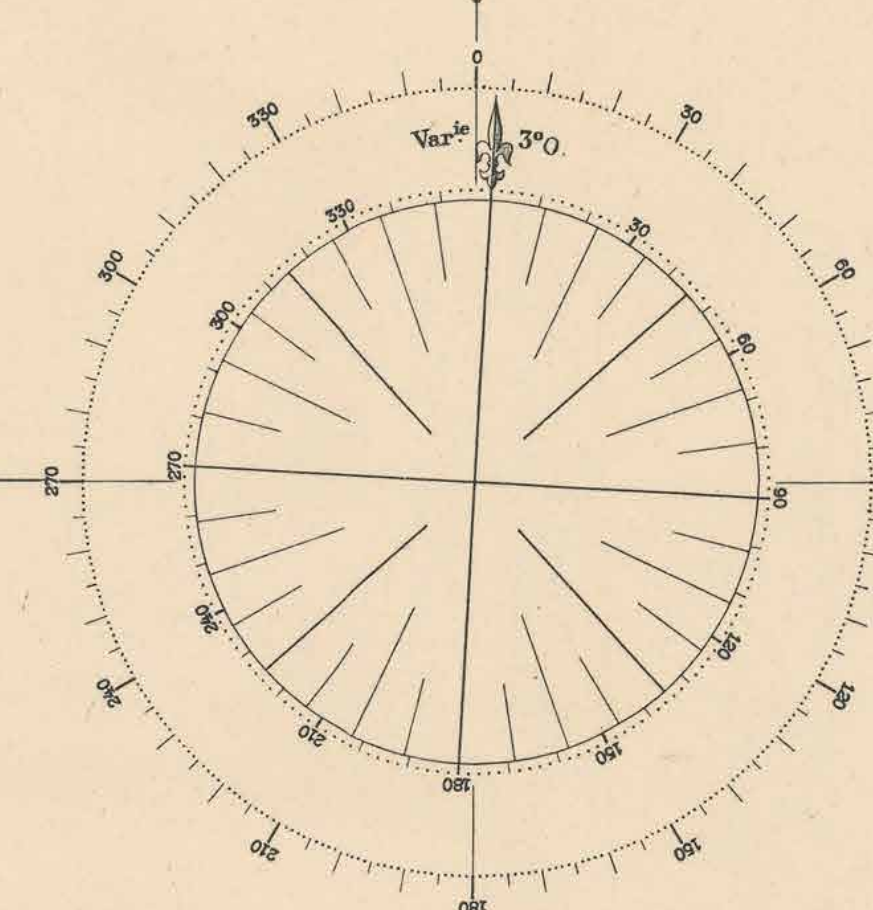
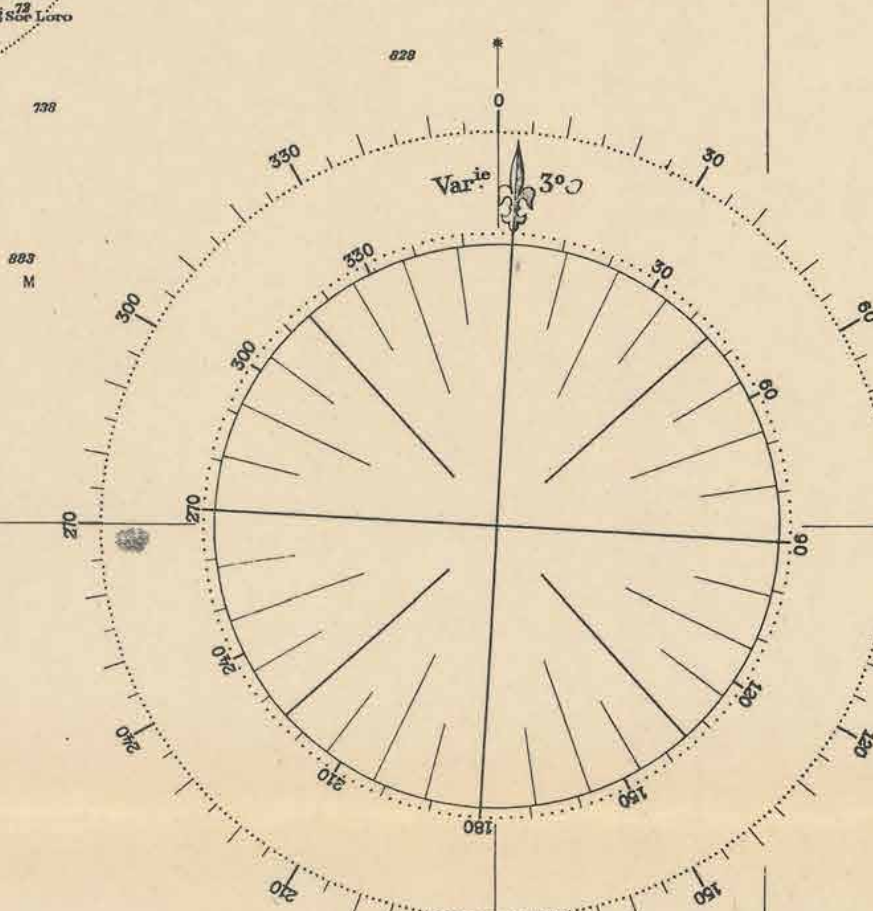
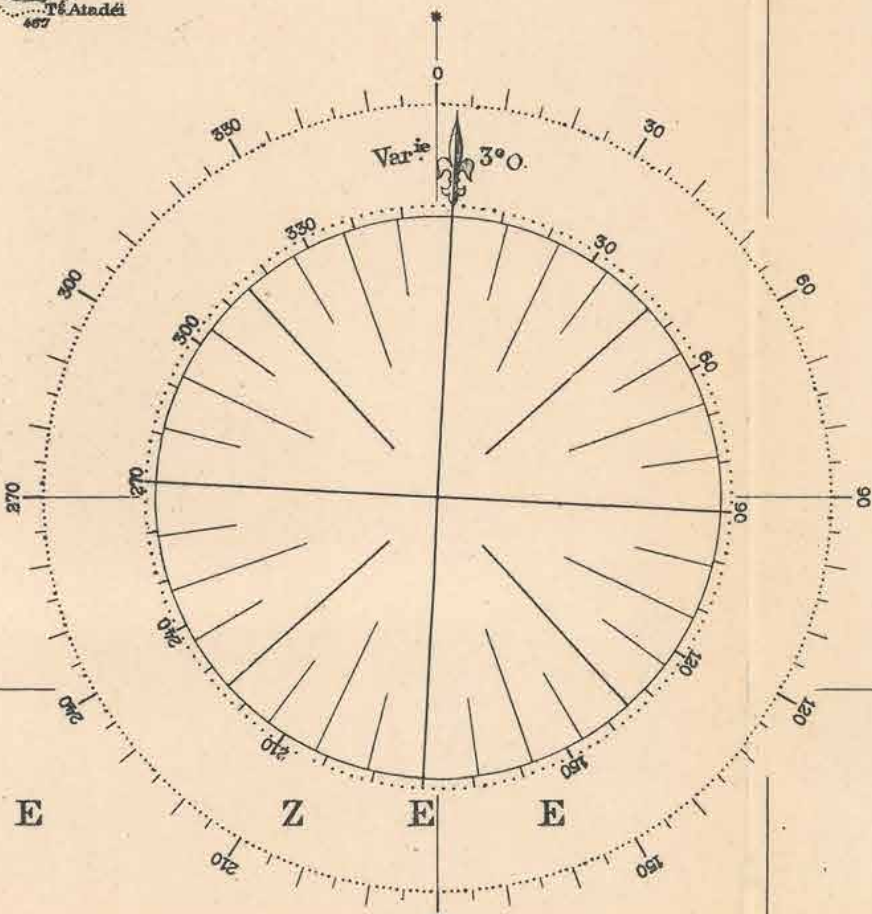
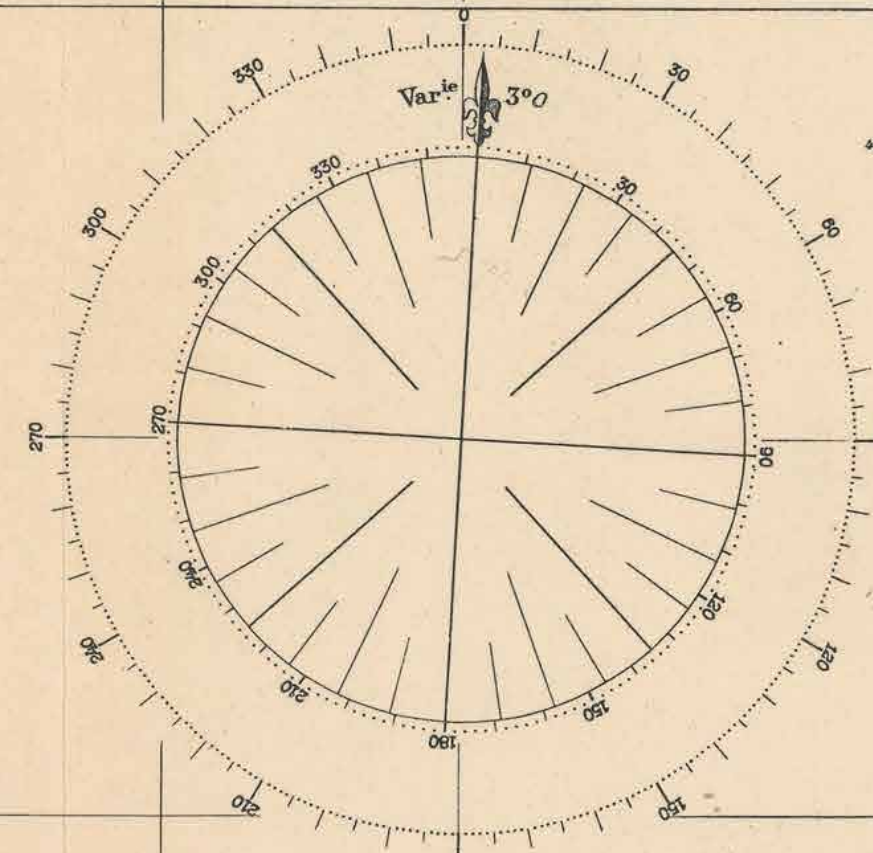
ROADS	---	CLIFFS	---
TRACKS	---	CORAL REEF	---
VILLAGES	■	SAND	---
RAIN FOREST	ll	CASUARINAS	---
MEDIUM TIMBER	ll	COCONUT PLANTATION	---
LIGHT TIMBER	ll	GRASSLAND	---
SAVANNAH	ll	FENCES	---
OPEN SWAMP	ll	TRIG. STATIONS	---
MANGROVE SWAMP	ll	HILL FEATURES	---
TIMBERED SWAMP	ll	ANCHORAGES	---
TIMBER BOUNDARIES	---		



MAP 5
CAPE BEASSO

Allied Geographical Section 3 Mar. 49

For English Translation see Chart No. 1 (Dutch Catalogue)



KLEINE SOENDA-EILANDEN
EN
AANGRENZENDE VAARWATERS
BLAD V
1:510.000

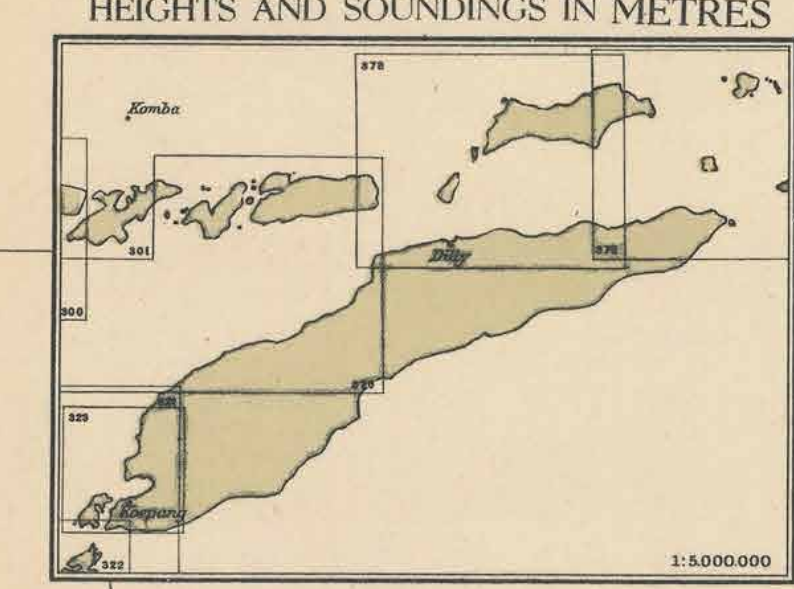
W. Klei, Kr. Koraal, M. Modder, S. Schelpen, St. Steenen, Z. Zand.
Lichten: O. Onderbroken, S. Schitter, V. Vast, G. O. Groeponderbroken, G. S. Groepschitt
g. groen, r. rood, w. wit, M. Zeemijlen.

DIEPTEN EN BERGHOOGTEN IN METERS.

M^o (Hoehoën) betekent Berg
 M^a (Meta op Tisser) } = Rivier
 (Meta op Witter)
 T^o (Toetoen) }
 W^o (Wootoen) } = Hoek

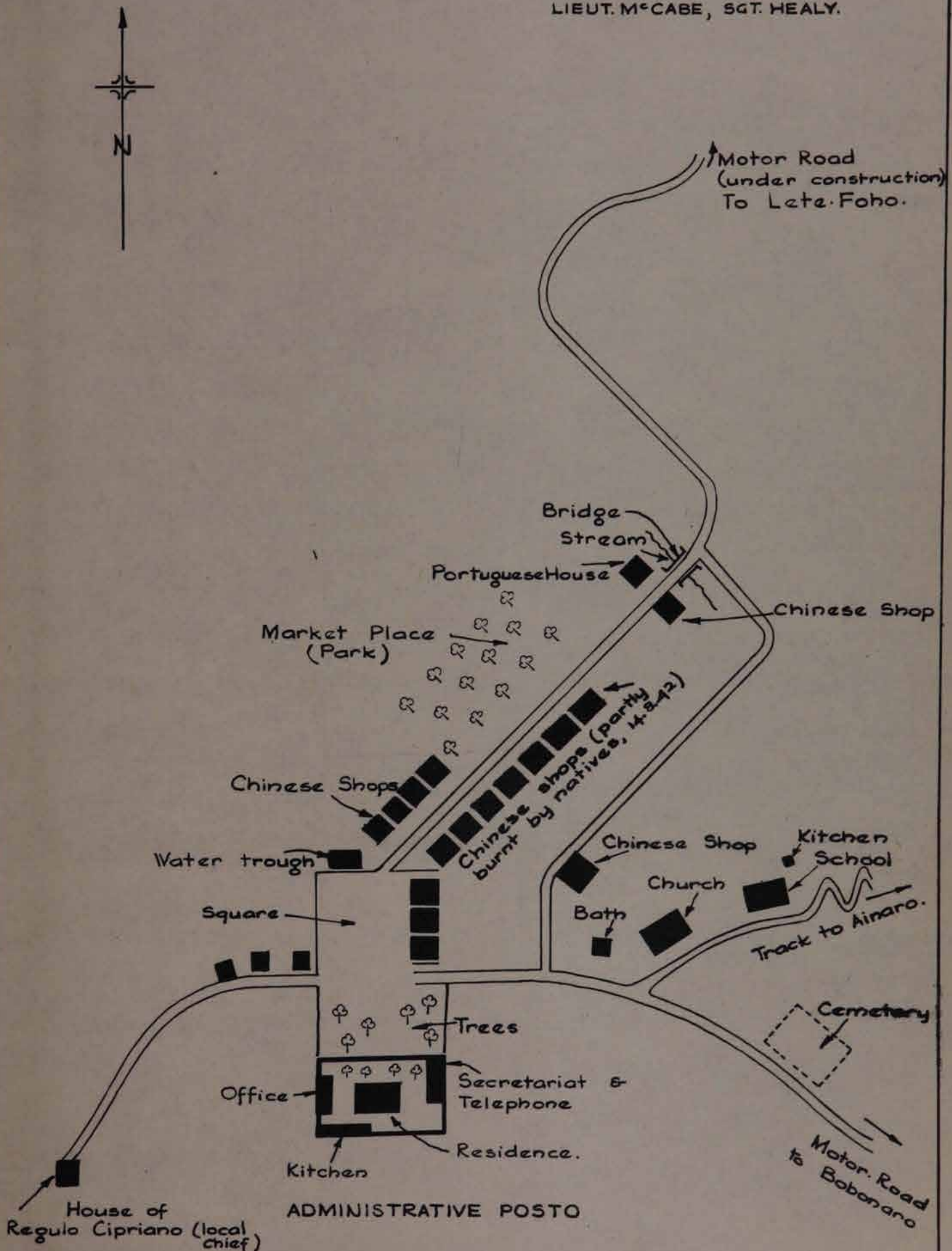
Metre Fathom	Metre Fathom	Metre Fath
1 0 ₃	11 6	25 14
2 1	12 6 ₃	30 16
3 1 ₄	13 7	35 19
4 2 ₁	14 7 ₄	40 22
5 2 ₄	15 8	50 27
6 3 ₂	16 8 ₅	60 33
7 3 ₅	17 9 ₂	70 36
8 4	18 9	80 43
9 4 ₅	19 10	90 45
10 5	20 11	100 50

W¹ (Wootton) | Hoek



SKETCH MAP OF ATSABE (NOVA OUREM)

FROM INDEPENDENT DESCRIPTIONS
& SKETCHES BY CAPT. DA SILVA
LIEUT. McCABE, SGT. HEALY.



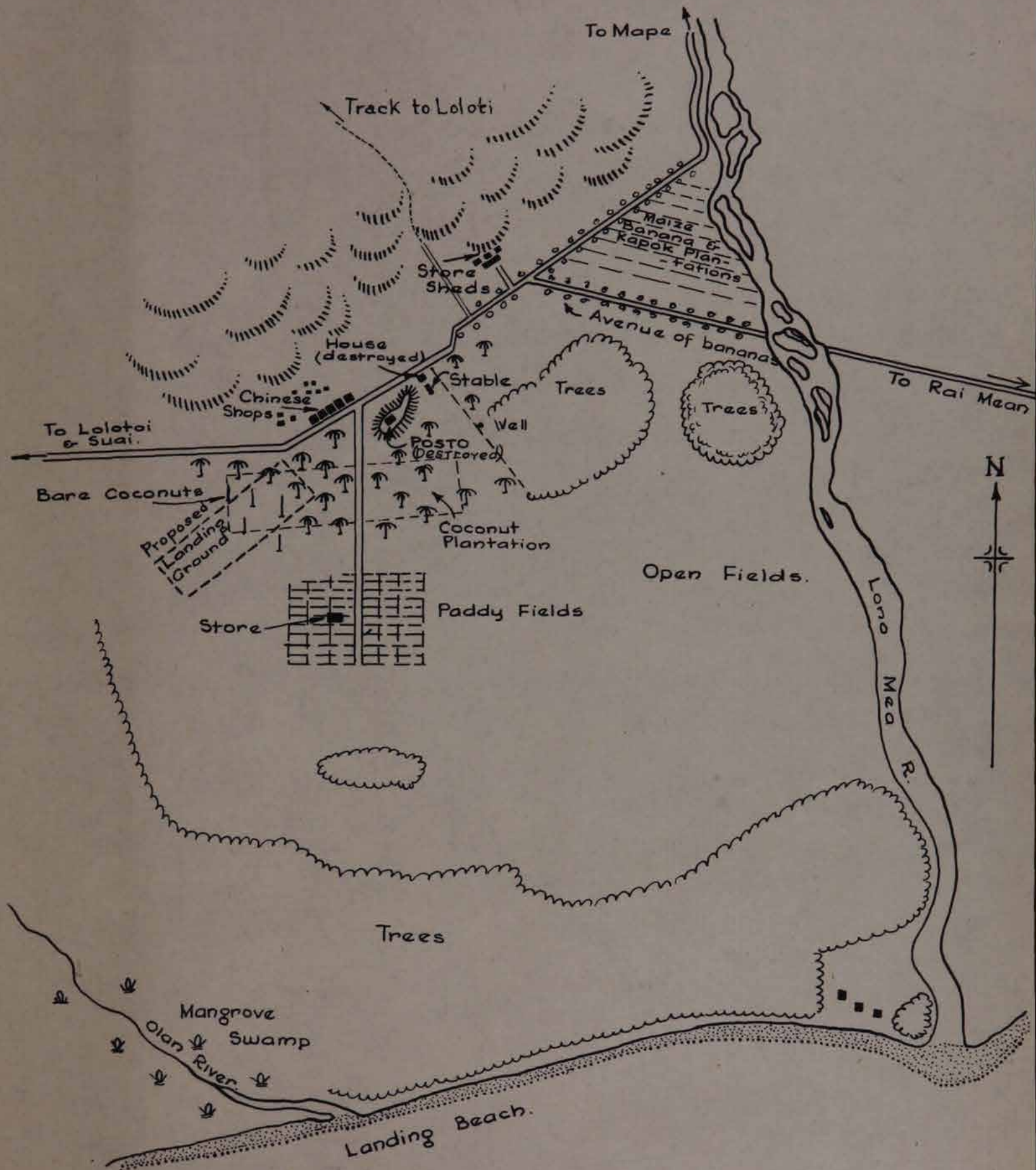
C.I.U. HQ. A.A.F.

MAP. 7.

SKETCH MAP OF BECO

(Sketched from Oblique Photos)

Dec. 1942

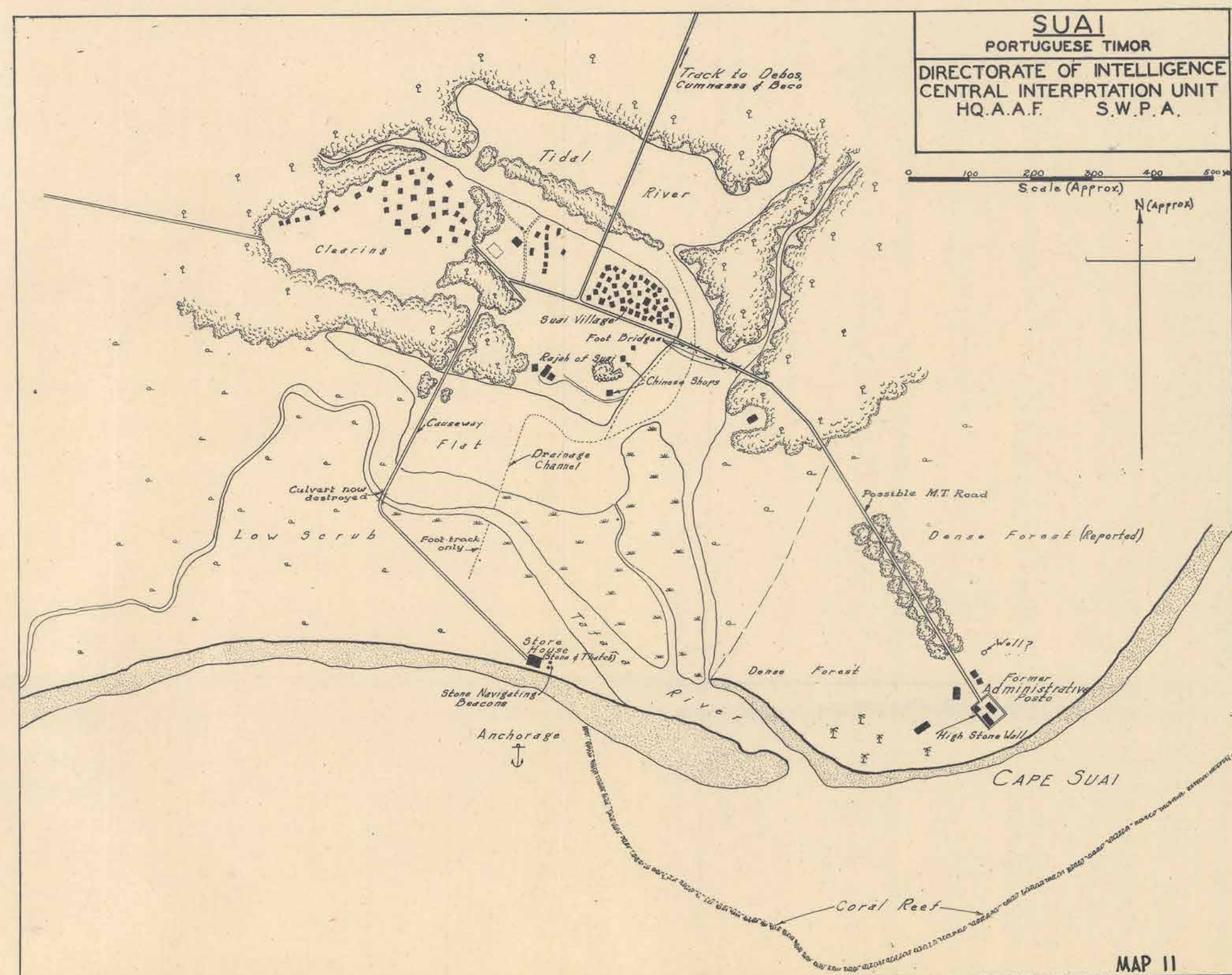
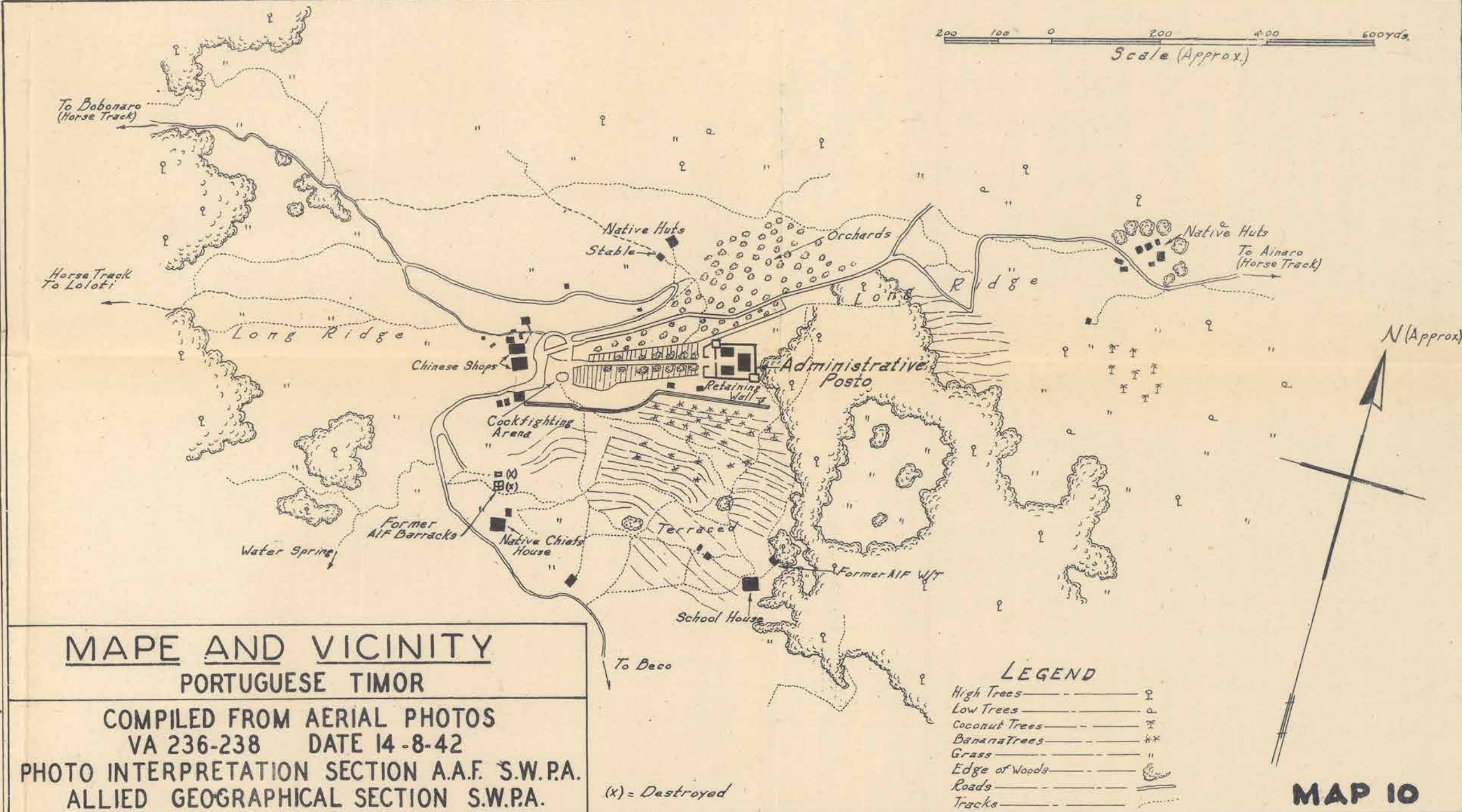
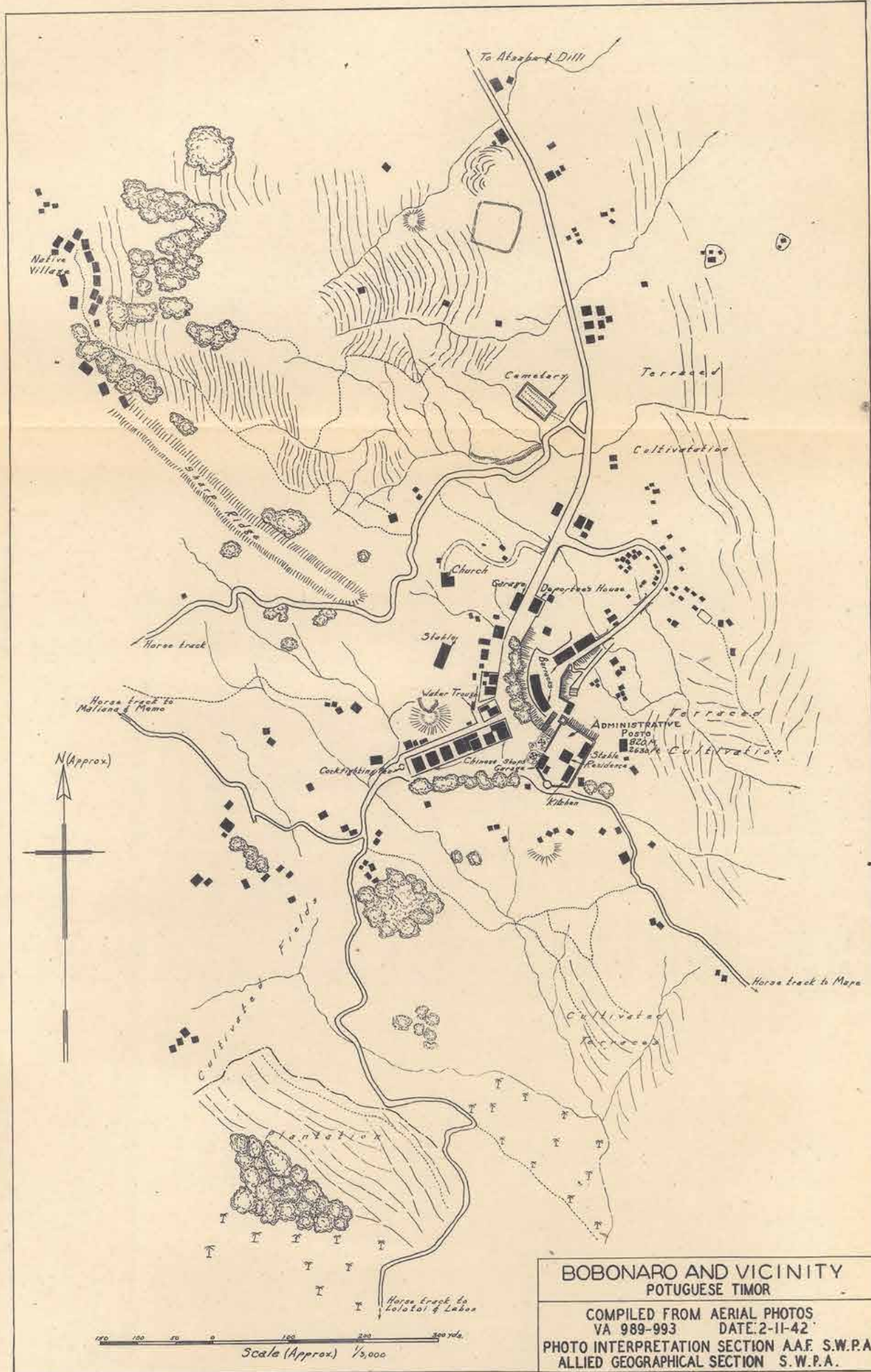


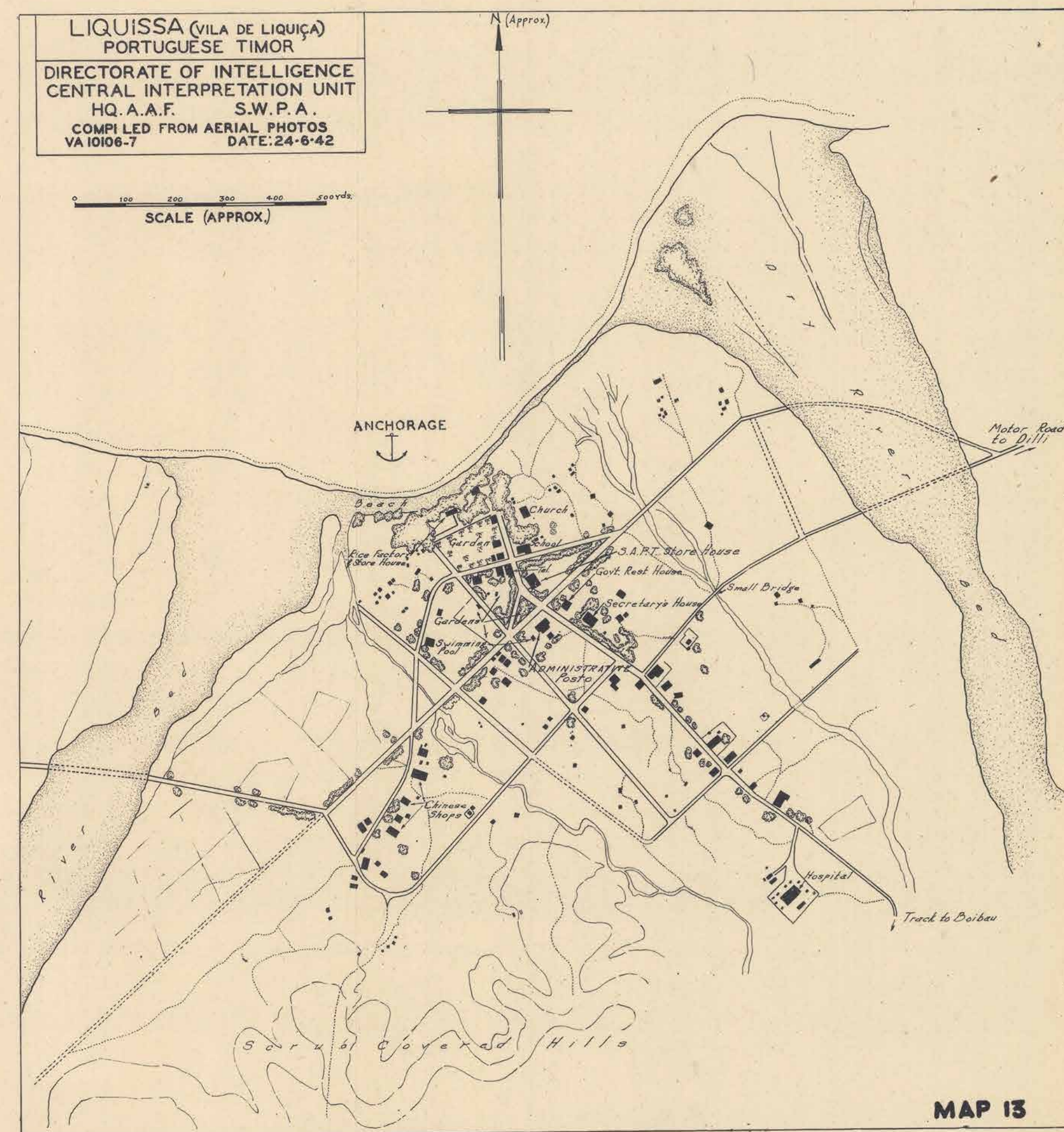
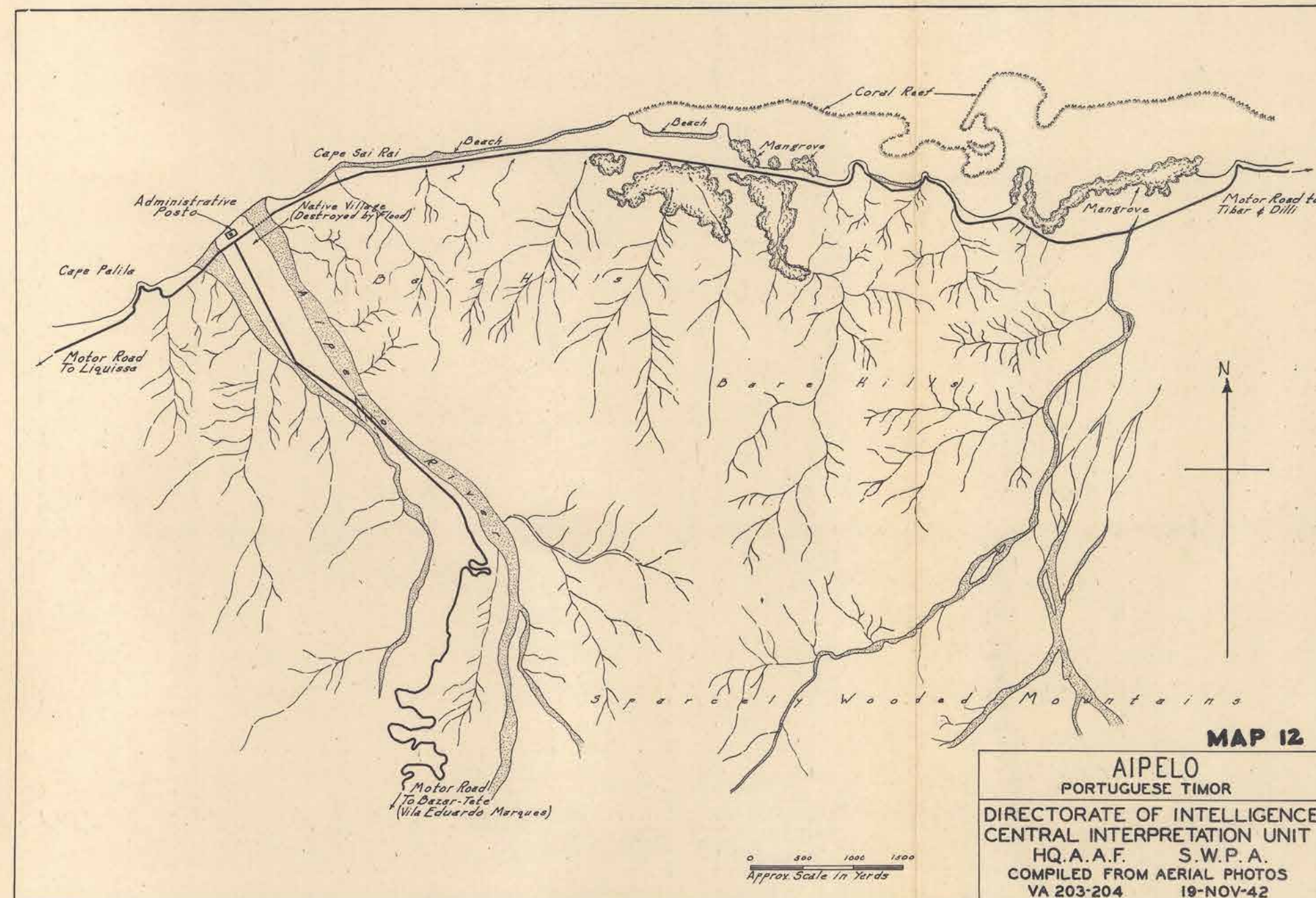
0 1/2 1 1 1/2 2 Miles

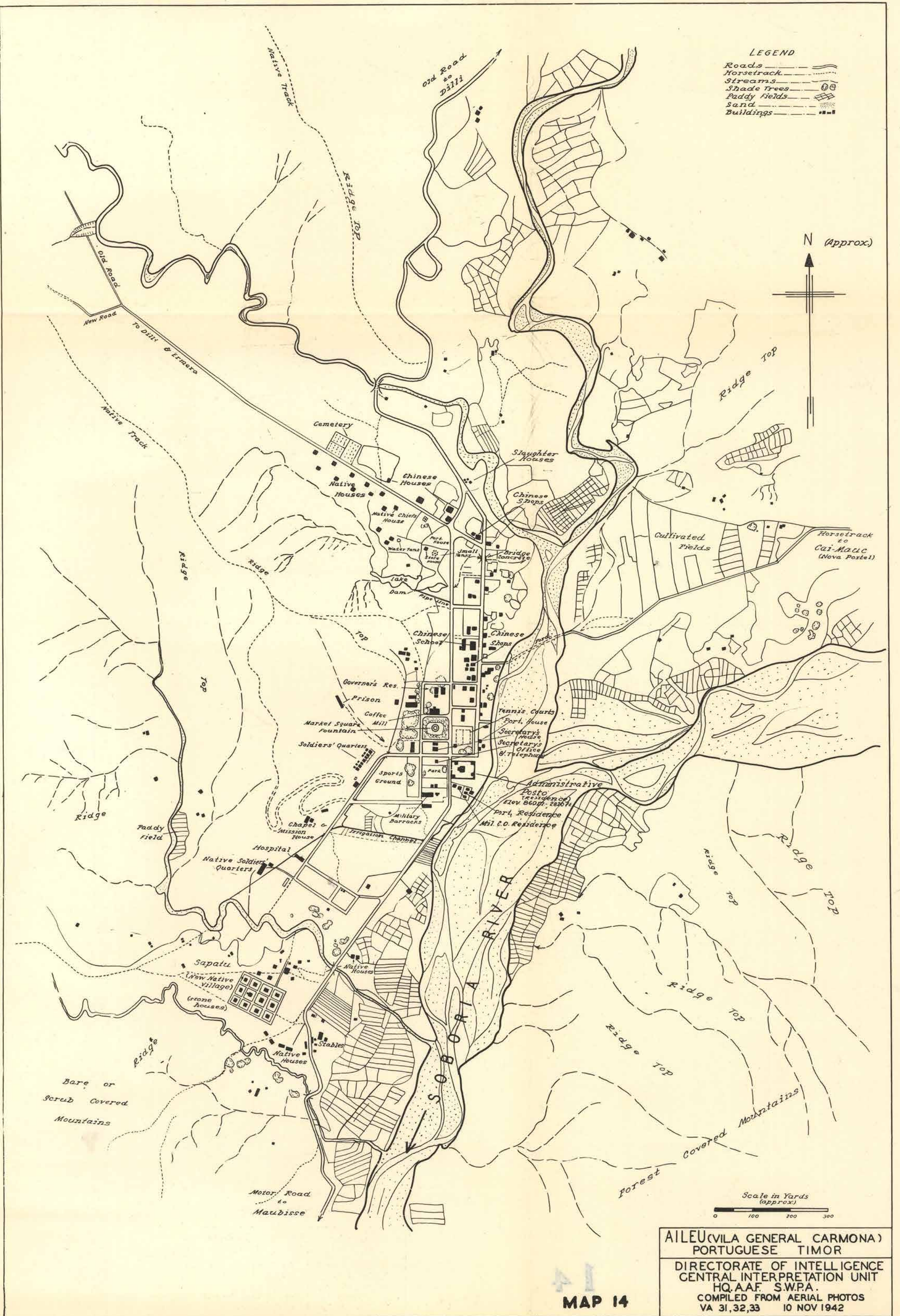
APPROX SCALE

C.I.U. HQ.A.AF.

MAP 8



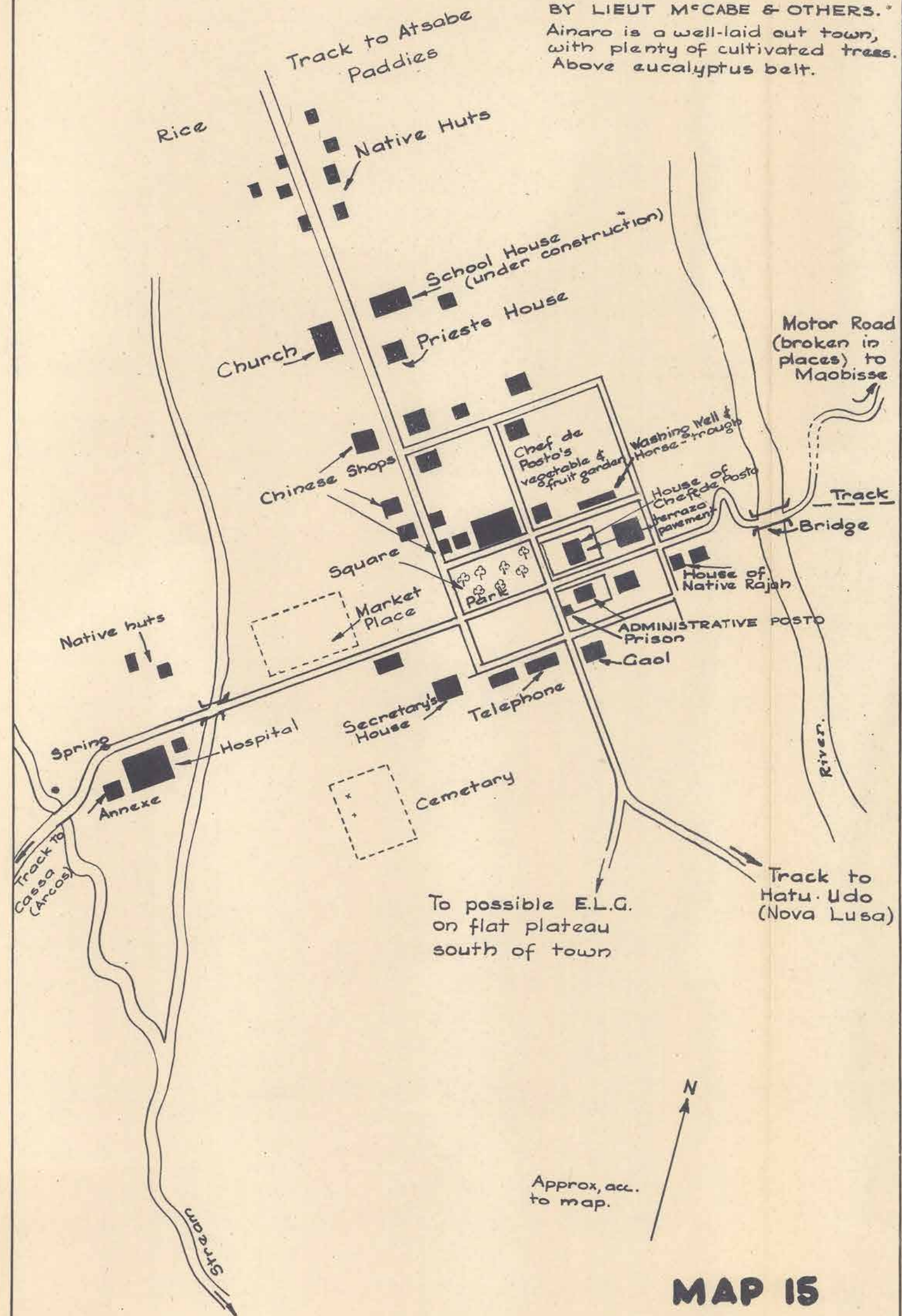




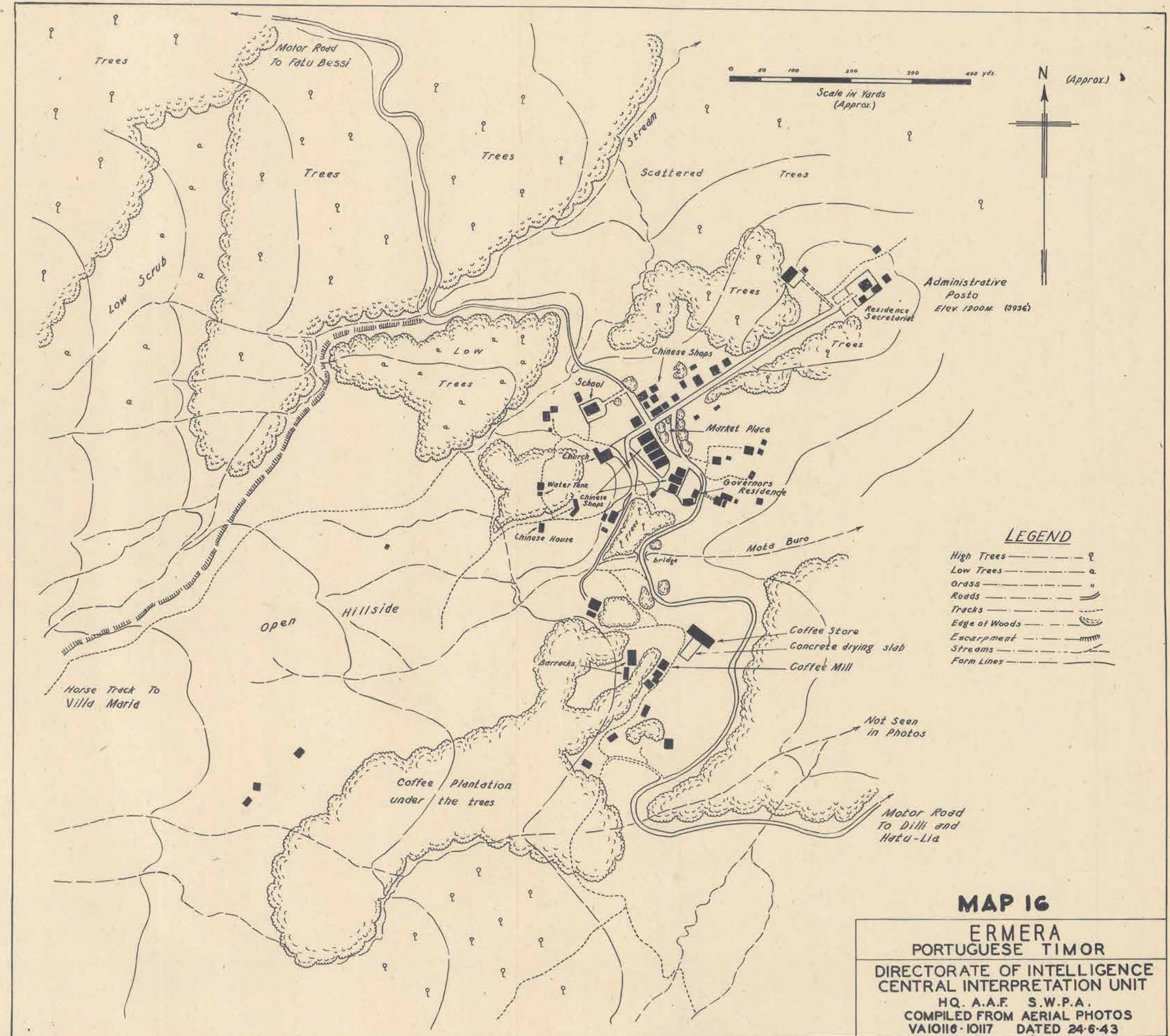
SKETCH MAP OF AINARO

FROM DESCRIPTIONS & SKETCHES
BY LIEUT M'CABE & OTHERS.

Ainaro is a well-laid out town,
with plenty of cultivated trees.
Above eucalyptus belt.



MAP 15
C.I.U. H.Q. A.A.F



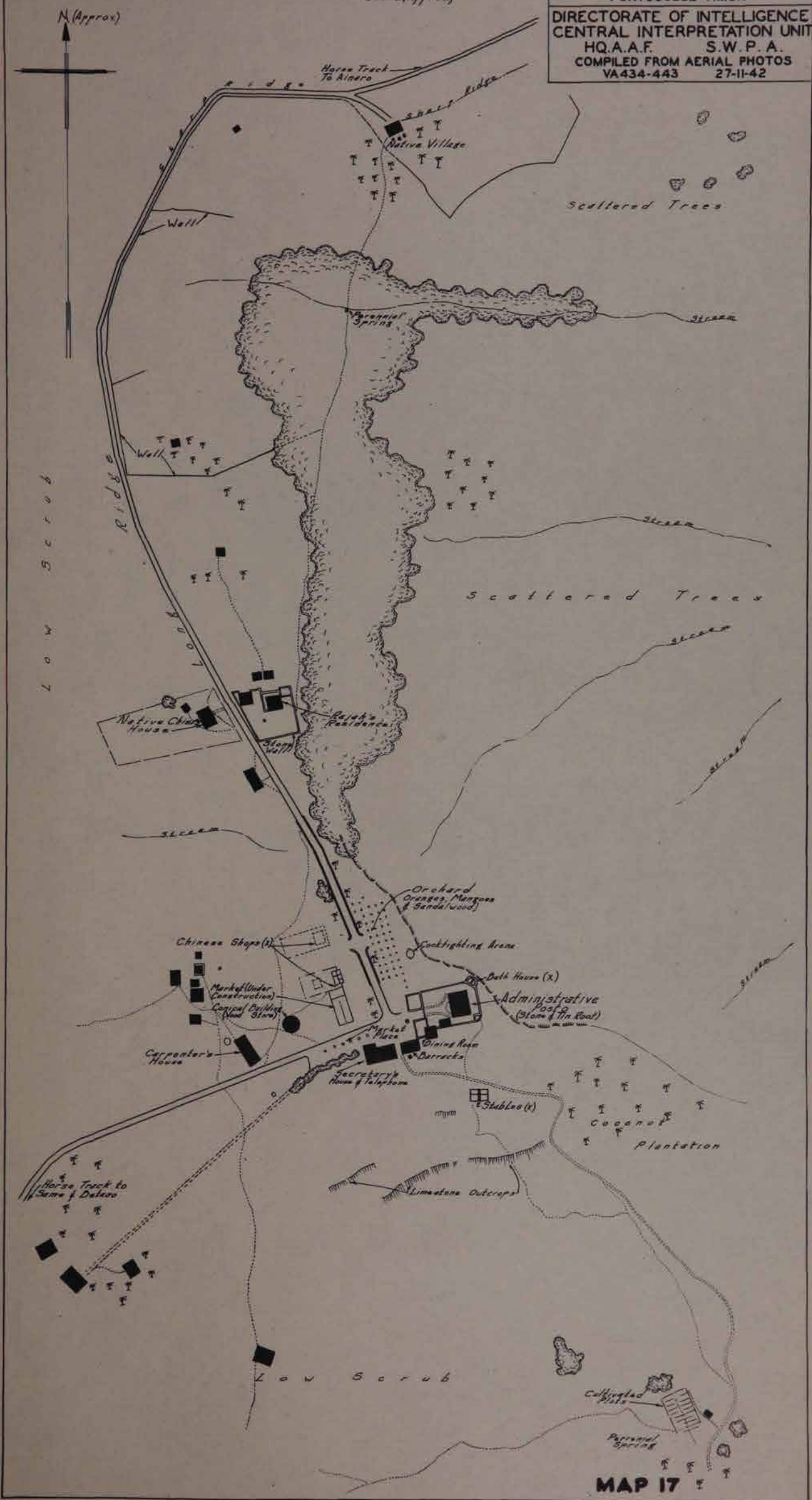
MAP 16
ERHERA
PORTUGUESE TIMOR
DIRECTORATE OF INTELLIGENCE
CENTRAL INTERPRETATION UNIT
H.Q. A.A.F. S.W.P.A.
COMPILED FROM AERIAL PHOTOS
VAIO116-10117 DATED 24-6-43

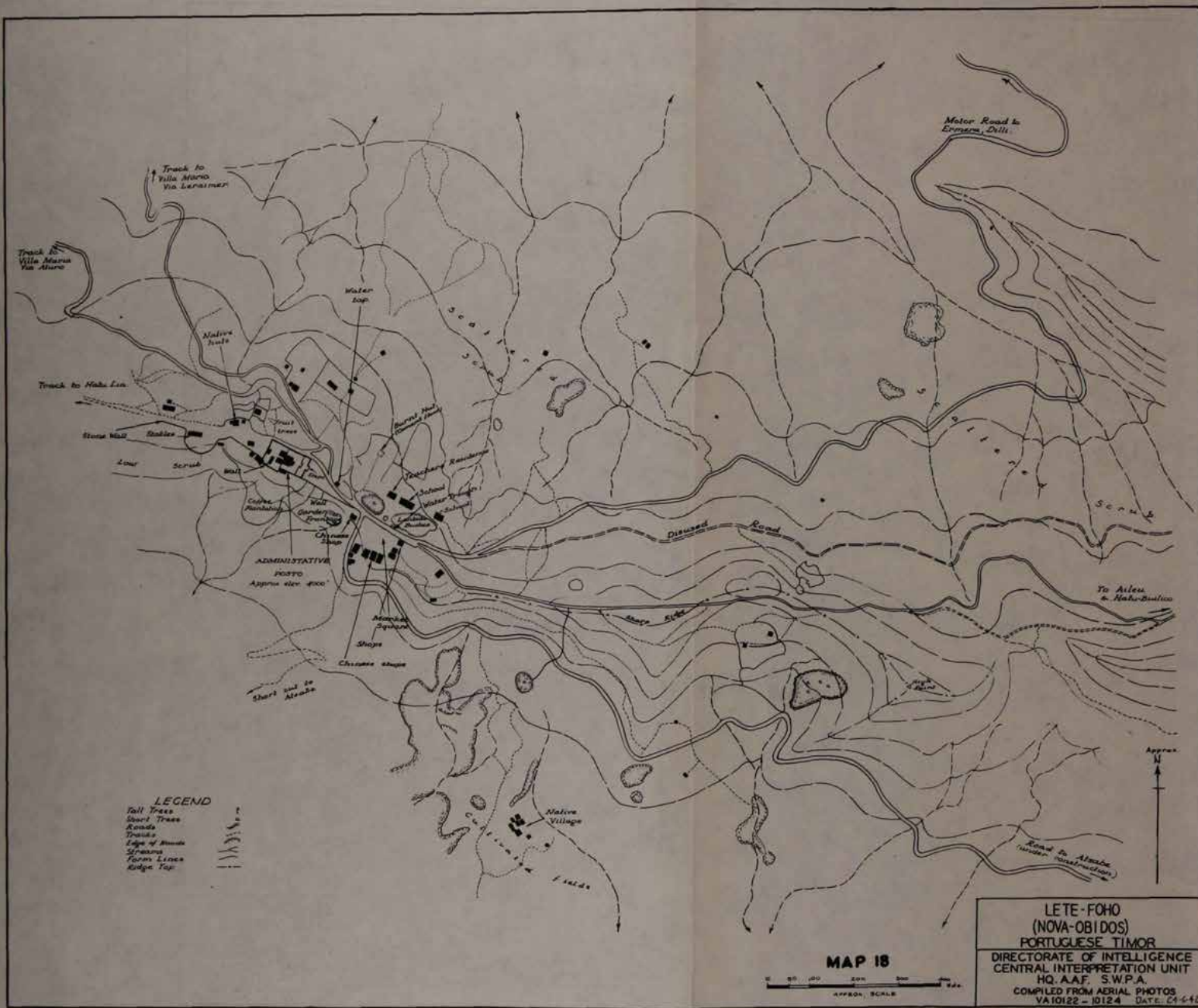
(X) Building Burned by Japanese
(X) Incendiary Bombs (4-8-42)

0 50 100 150 200 yds
Scale (Approx)

HATU-UDO (NOVA LUSA)
PORTUGUESE TIMOR

DIRECTORATE OF INTELLIGENCE
CENTRAL INTERPRETATION UNIT
H.Q.A.A.F. S.W.P.A.
COMPILED FROM AERIAL PHOTOS
VA434-443 27-11-42





LEGEND

- High Trees ———— p
- Low Trees ———— q
- Palm Trees ———— r
- Roads ———— s
- Tracks ———— t
- Streams ———— u
- Edge of Woods ———— v
- Sand & Gravel ———— w
- Dldgs. Destroyed ———— (x)

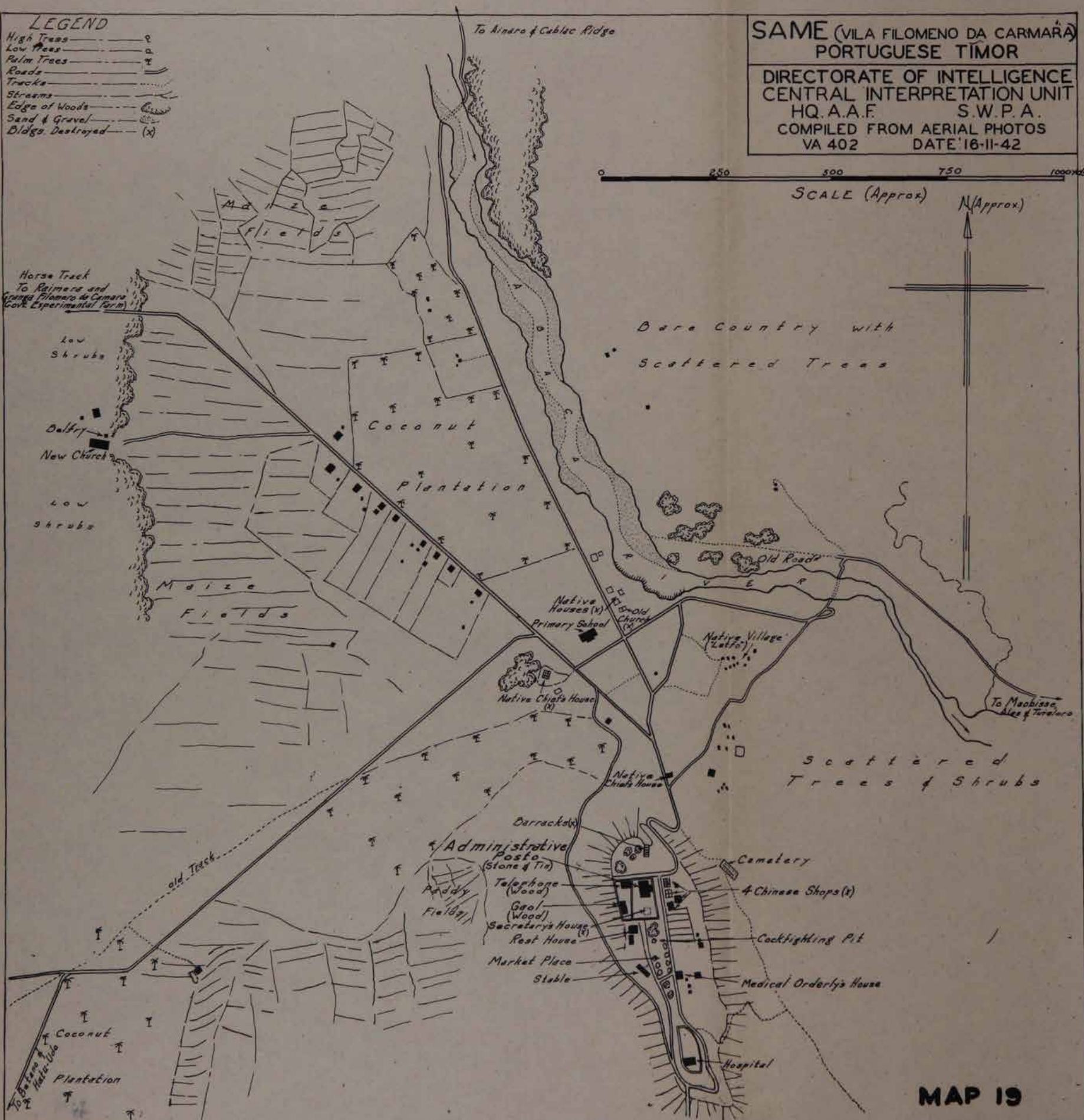
SAME (VILA FILOMENO DA CARMAÇA)
PORTUGUESE TIMOR

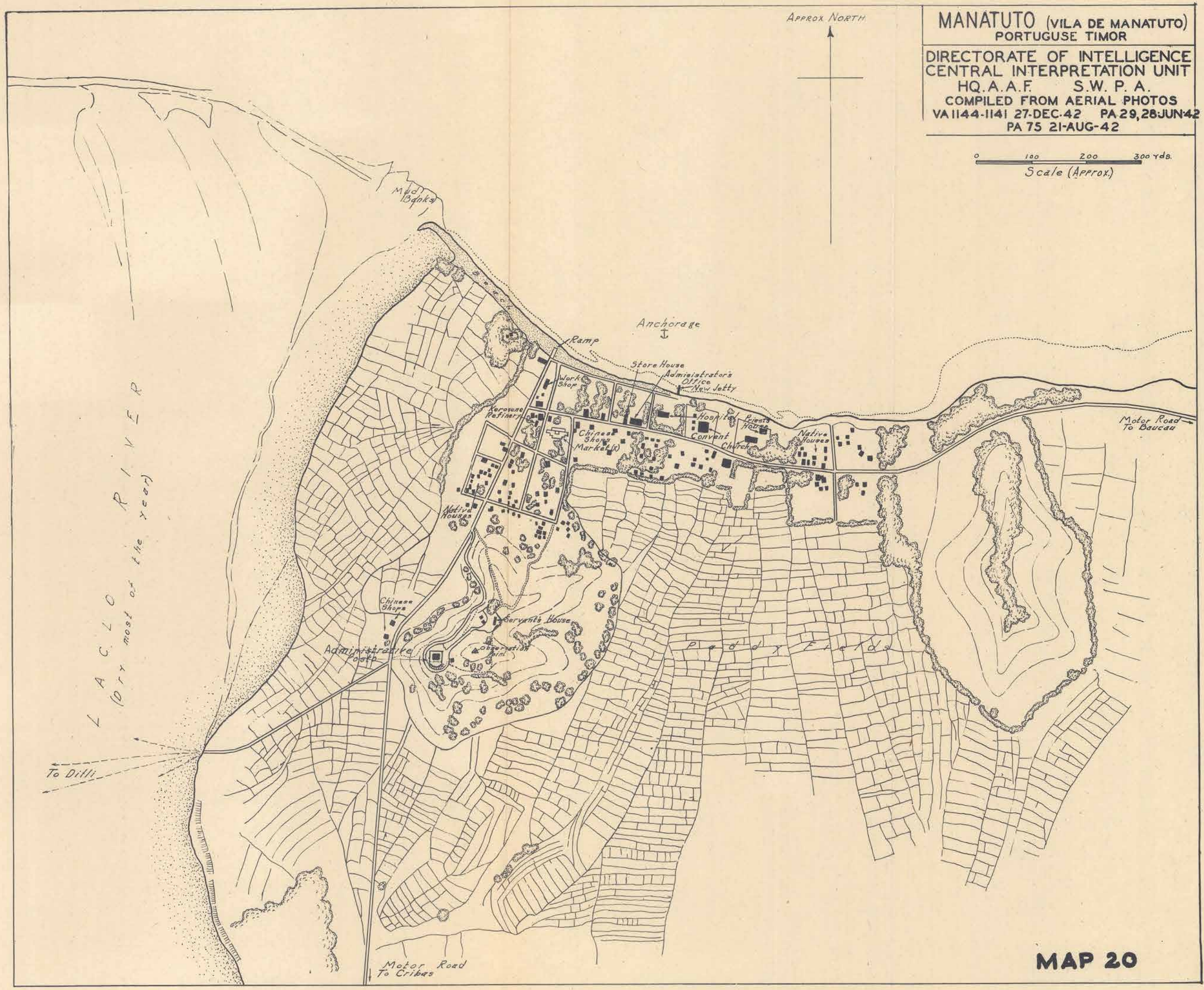
DIRECTORATE OF INTELLIGENCE
CENTRAL INTERPRETATION UNIT
H.Q. A.A.F. S.W.P.A.
COMPILED FROM AERIAL PHOTOS
VA 402 DATE 16-11-42

0 250 500 750 1000 Yds

SCALE (Approx)

N (Approx)

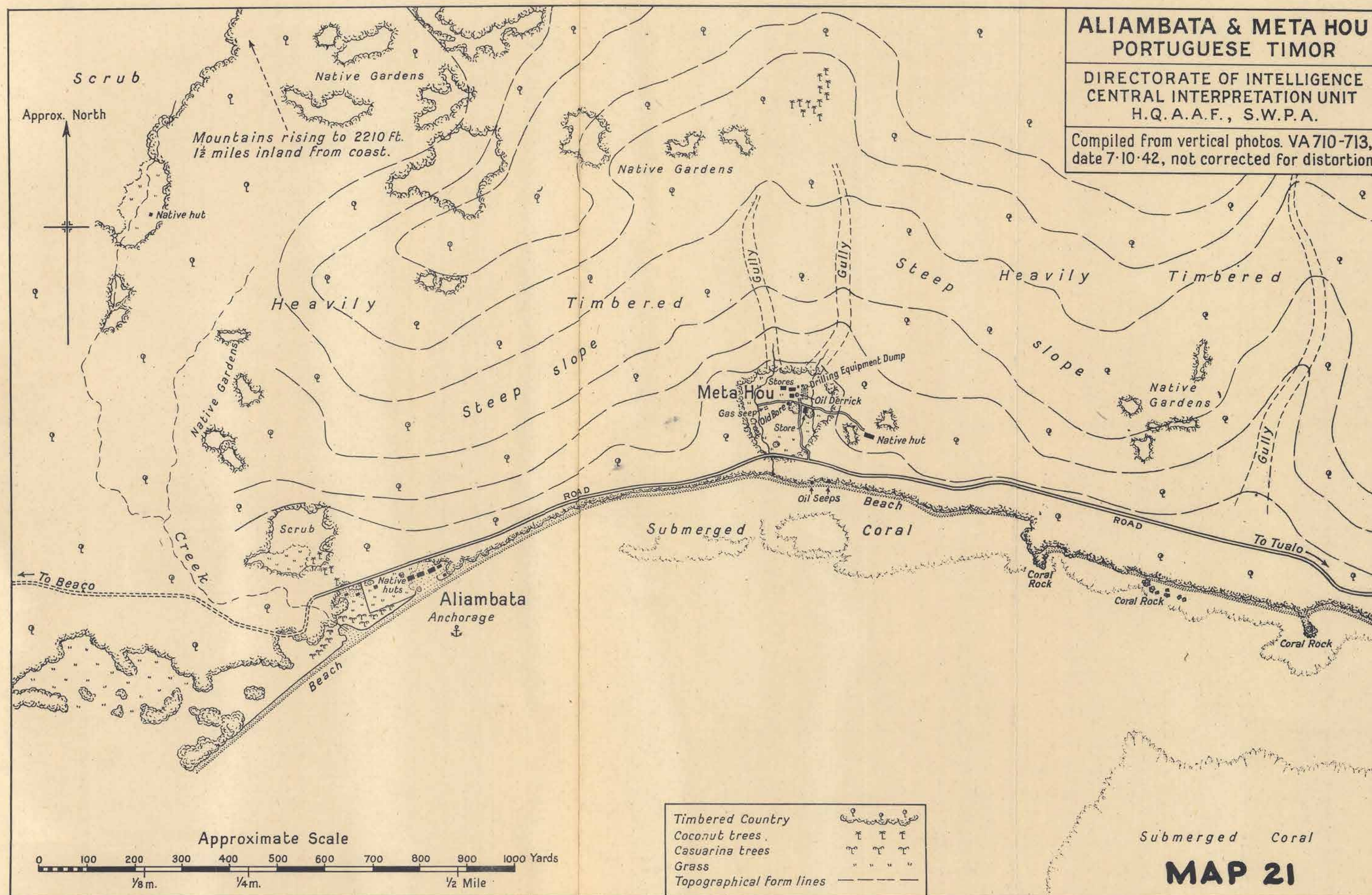


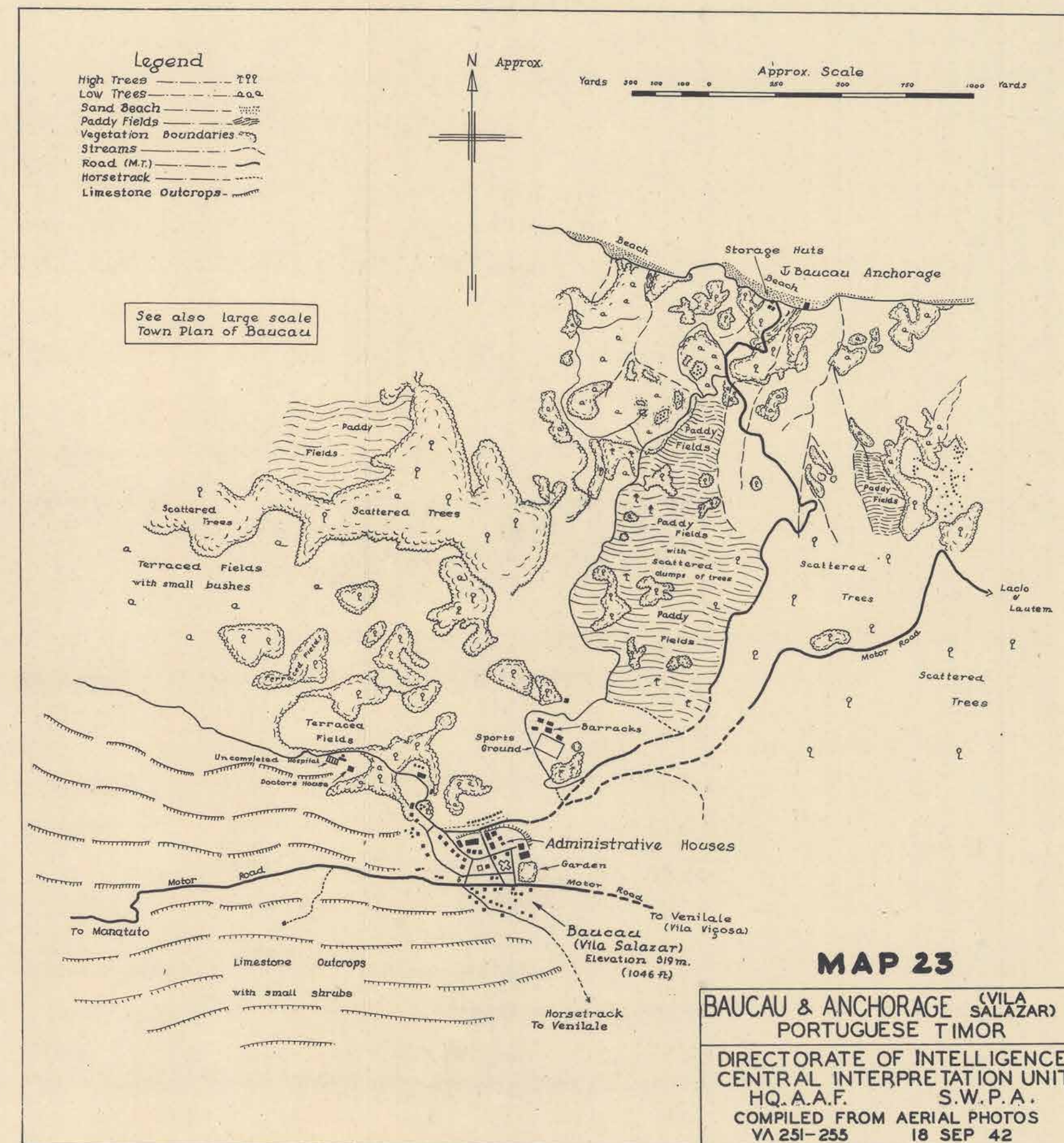
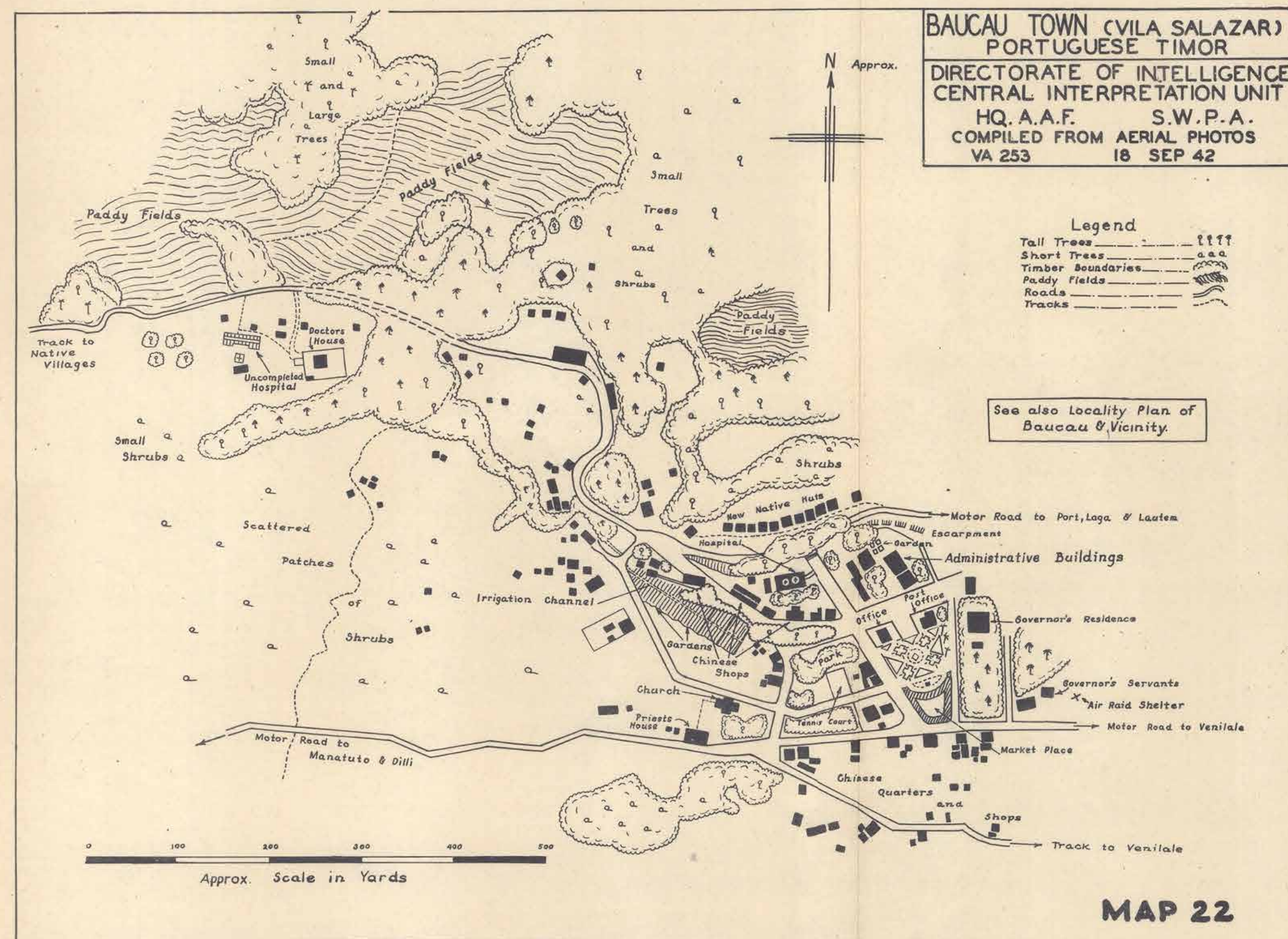


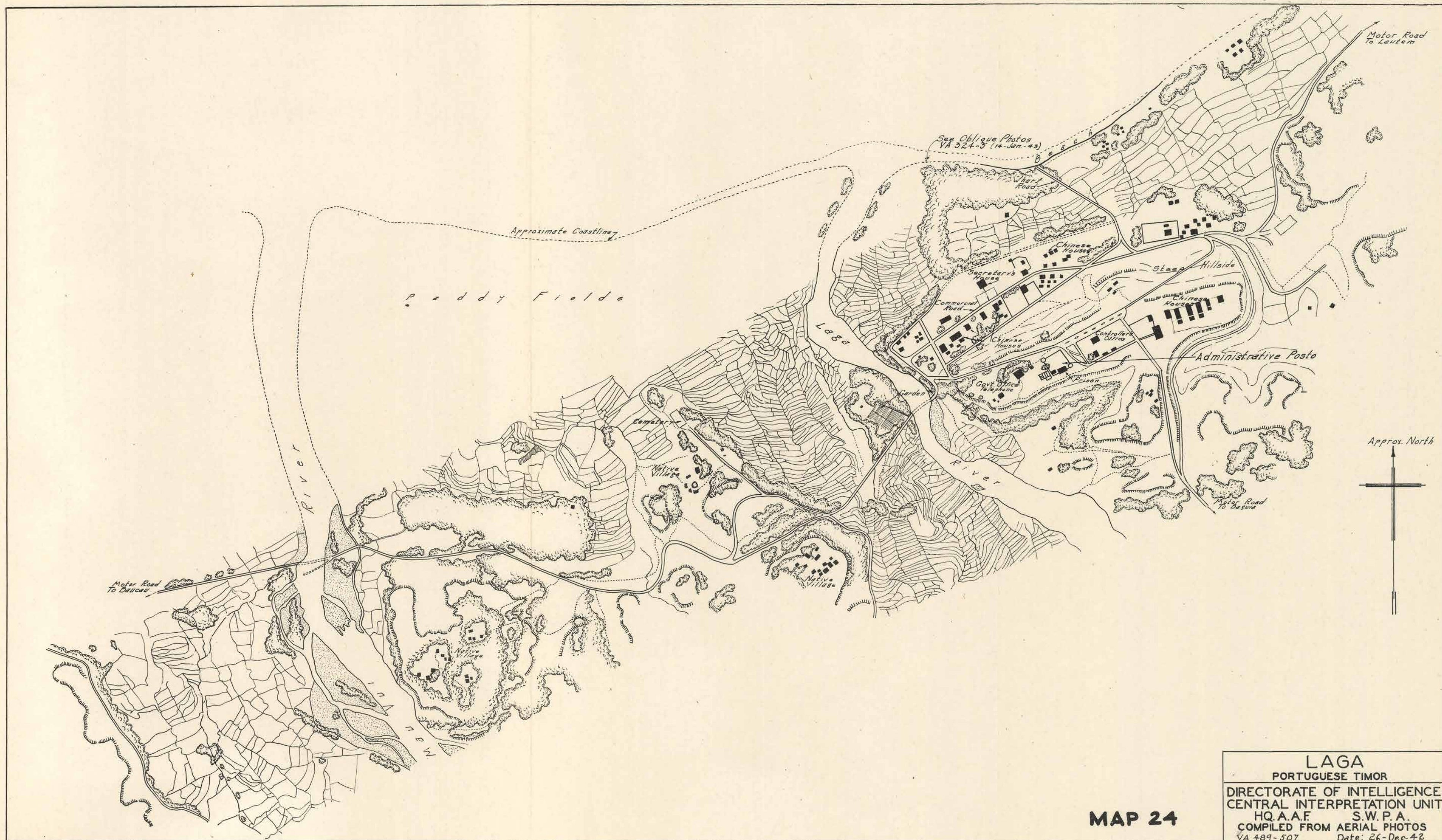
MANATUTO (VILA DE MANATUTO)
PORTUGUESE TIMOR
DIRECTORATE OF INTELLIGENCE
CENTRAL INTERPRETATION UNIT
HQ. A. A. F. S. W. P. A.
COMPILED FROM AERIAL PHOTOS
VA 1144-1141 27-DEC-42 PA 29,28JUN-42
PA 75 21-AUG-42

0 100 200 300 yds.
Scale (Approx.)

MAP 20







MAP 24

LAGA
PORTUGUESE TIMOR
DIRECTORATE OF INTELLIGENCE
CENTRAL INTERPRETATION UNIT
HQ. A.A.F. S.W. P. A.
COMPILED FROM AERIAL PHOTOS
VA 489-507 Date: 26-Dec-42

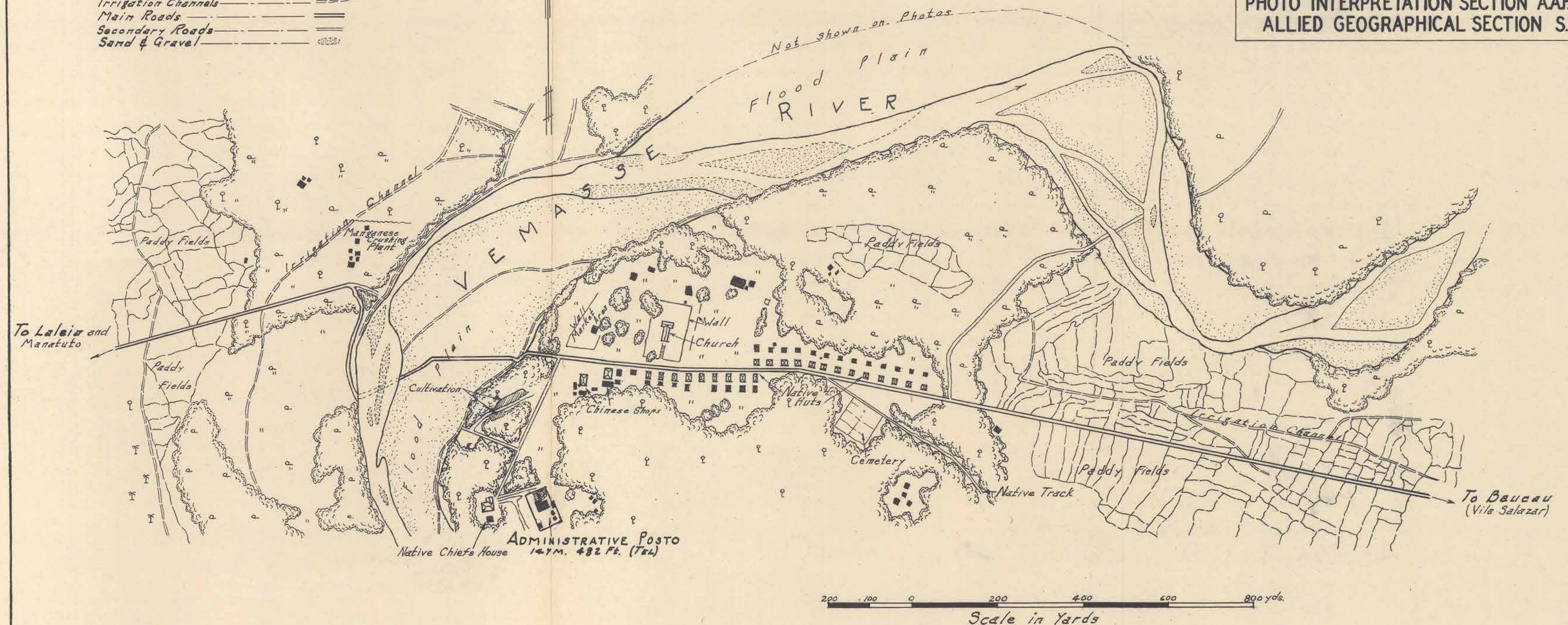
LEGEND

High Trees	⌒
Low Trees	⌒
Coconut Trees	⌒
Edge of Woods	⌒
Grass	⌒
Irrigation Channels	⌒
Main Roads	⌒
Secondary Roads	⌒
Sand & Gravel	⌒

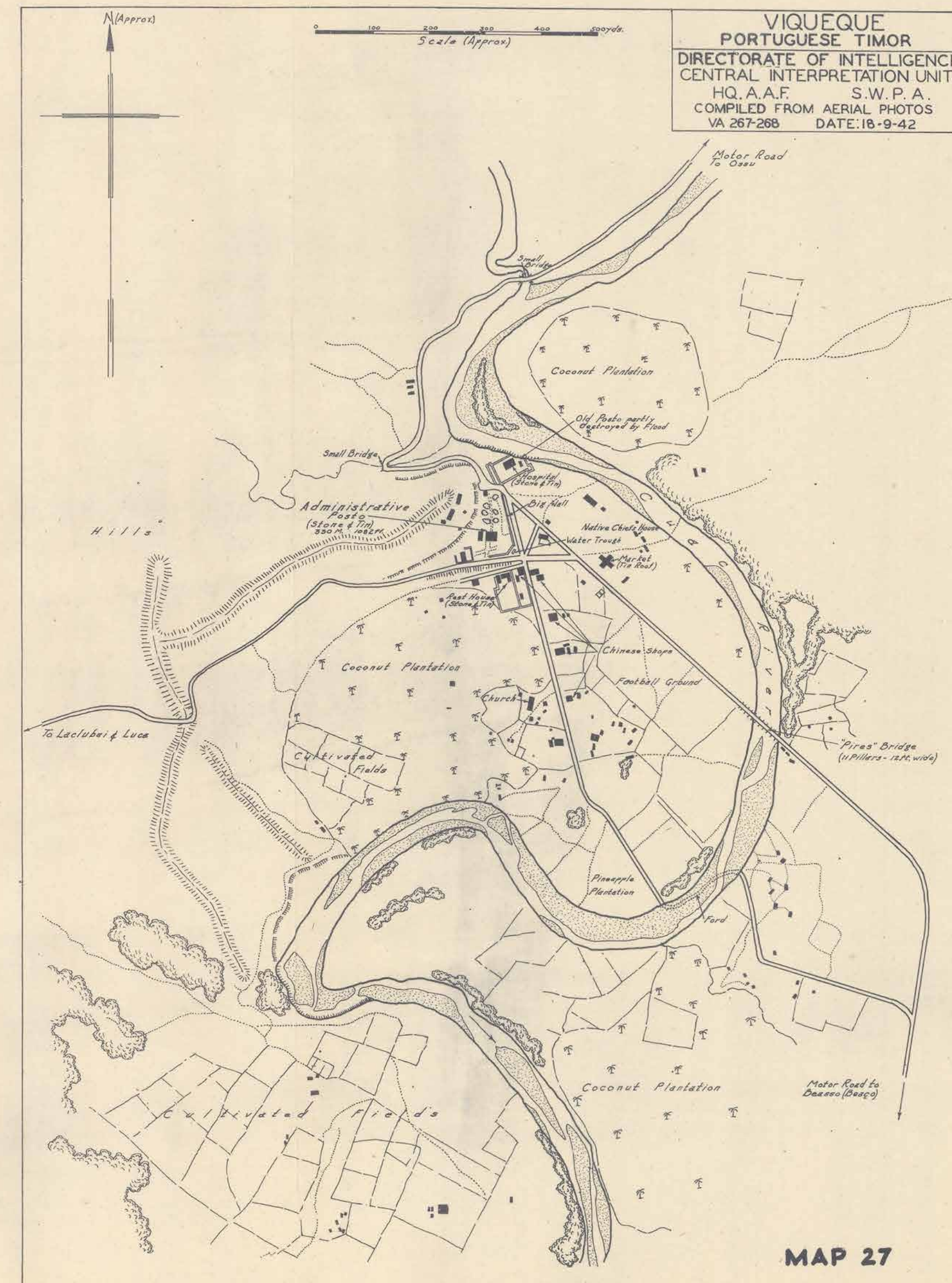
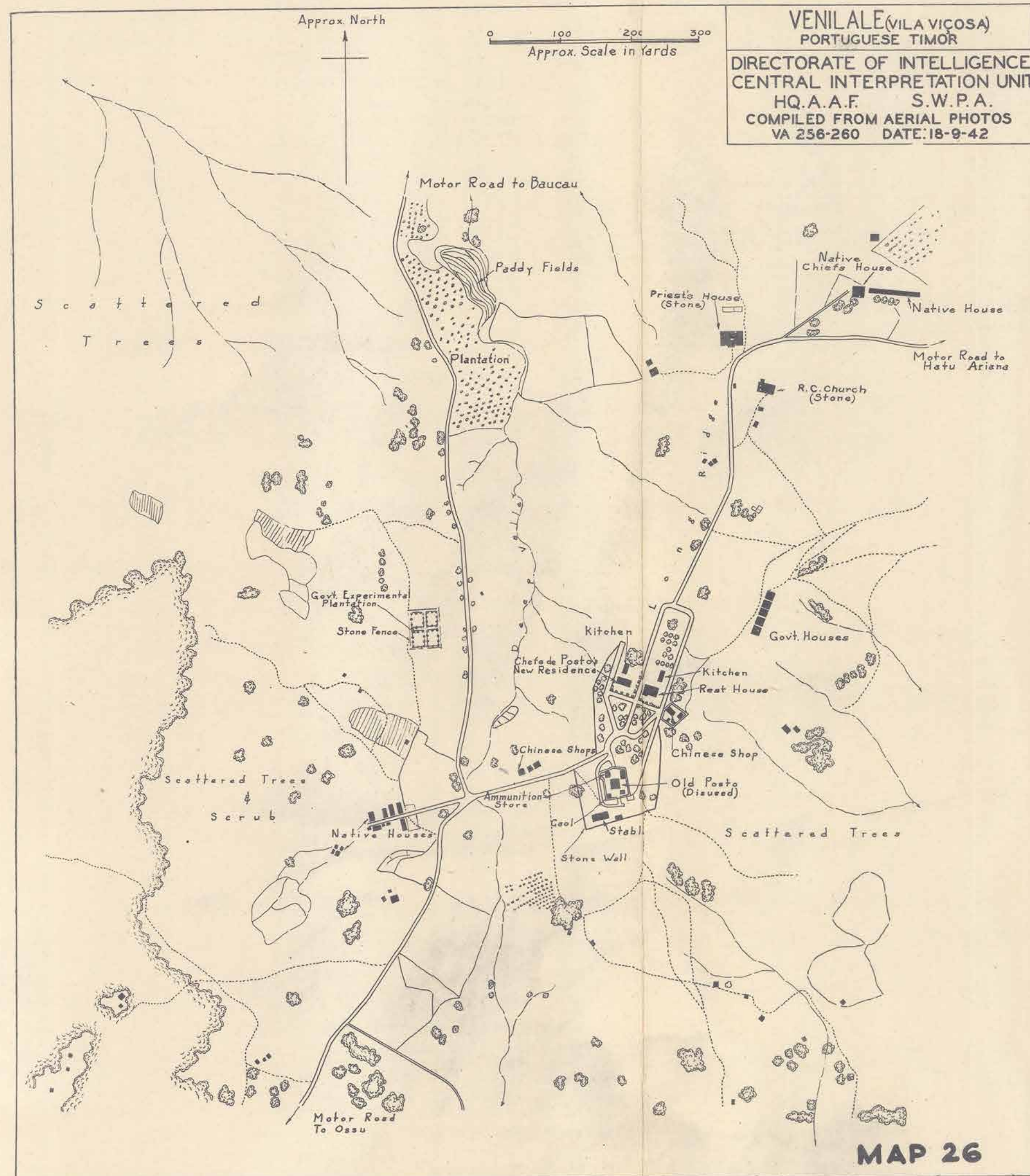
N (Approx.)

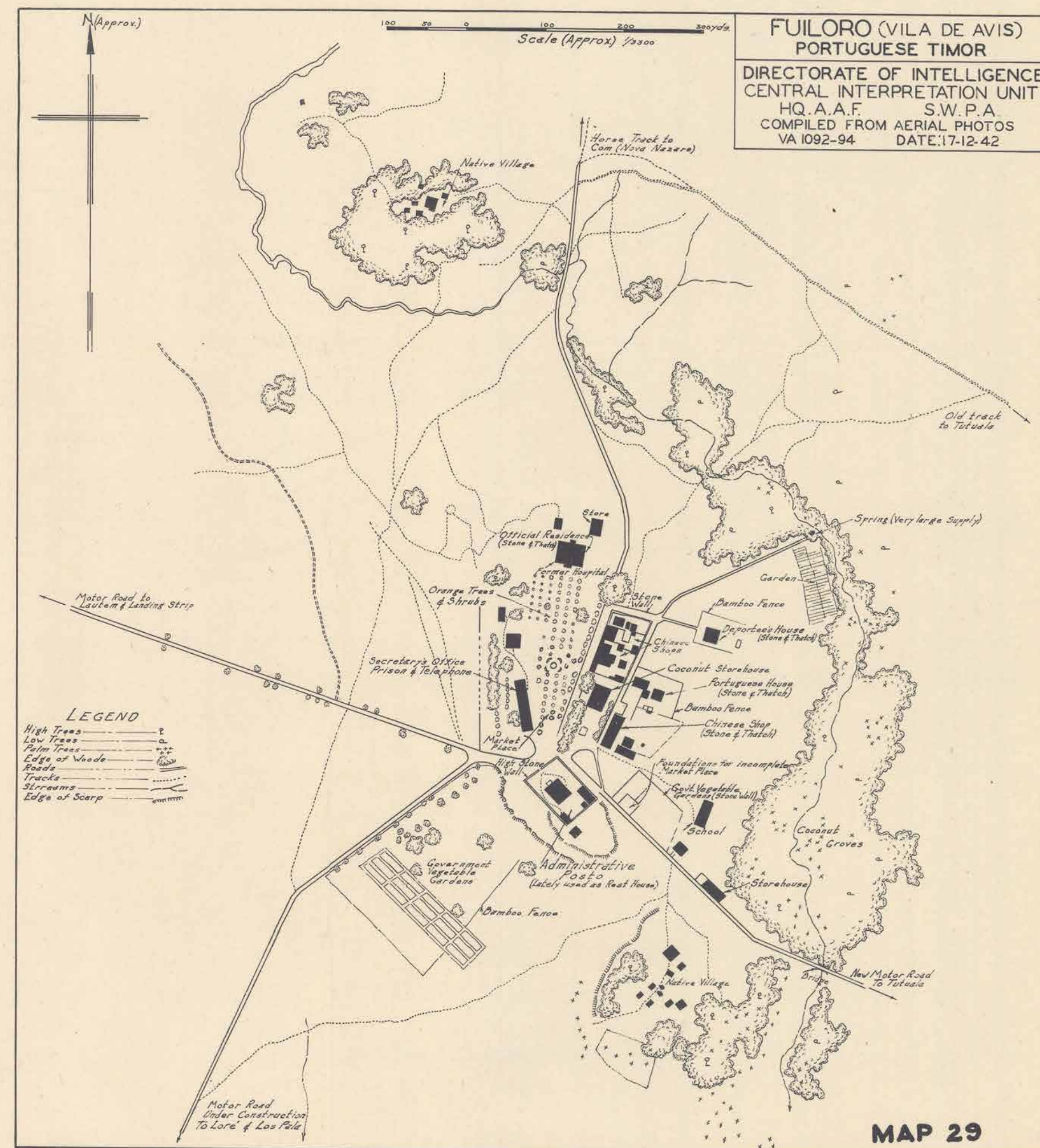
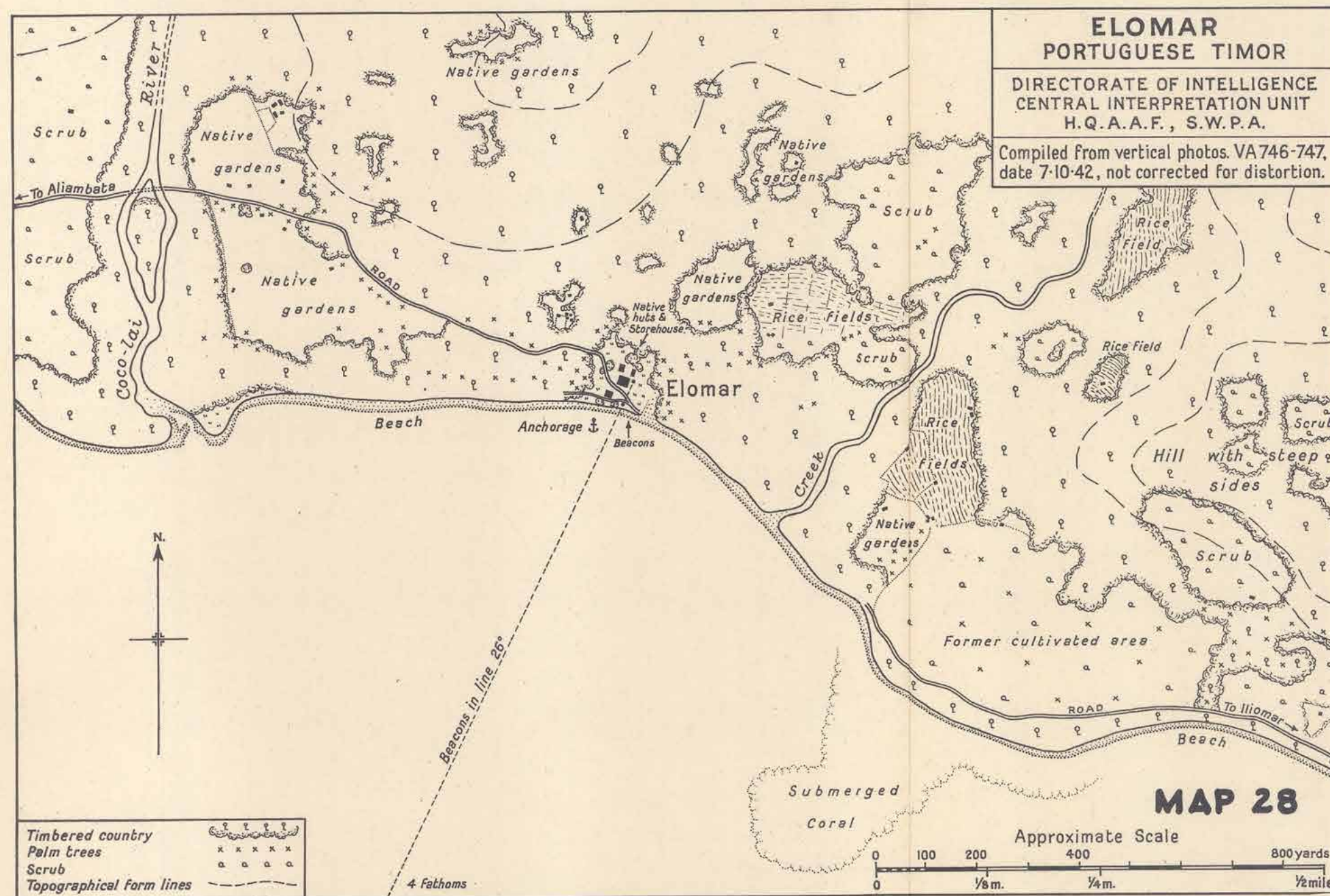
VEMASSE AND VICINITY PORTUGUESE TIMOR

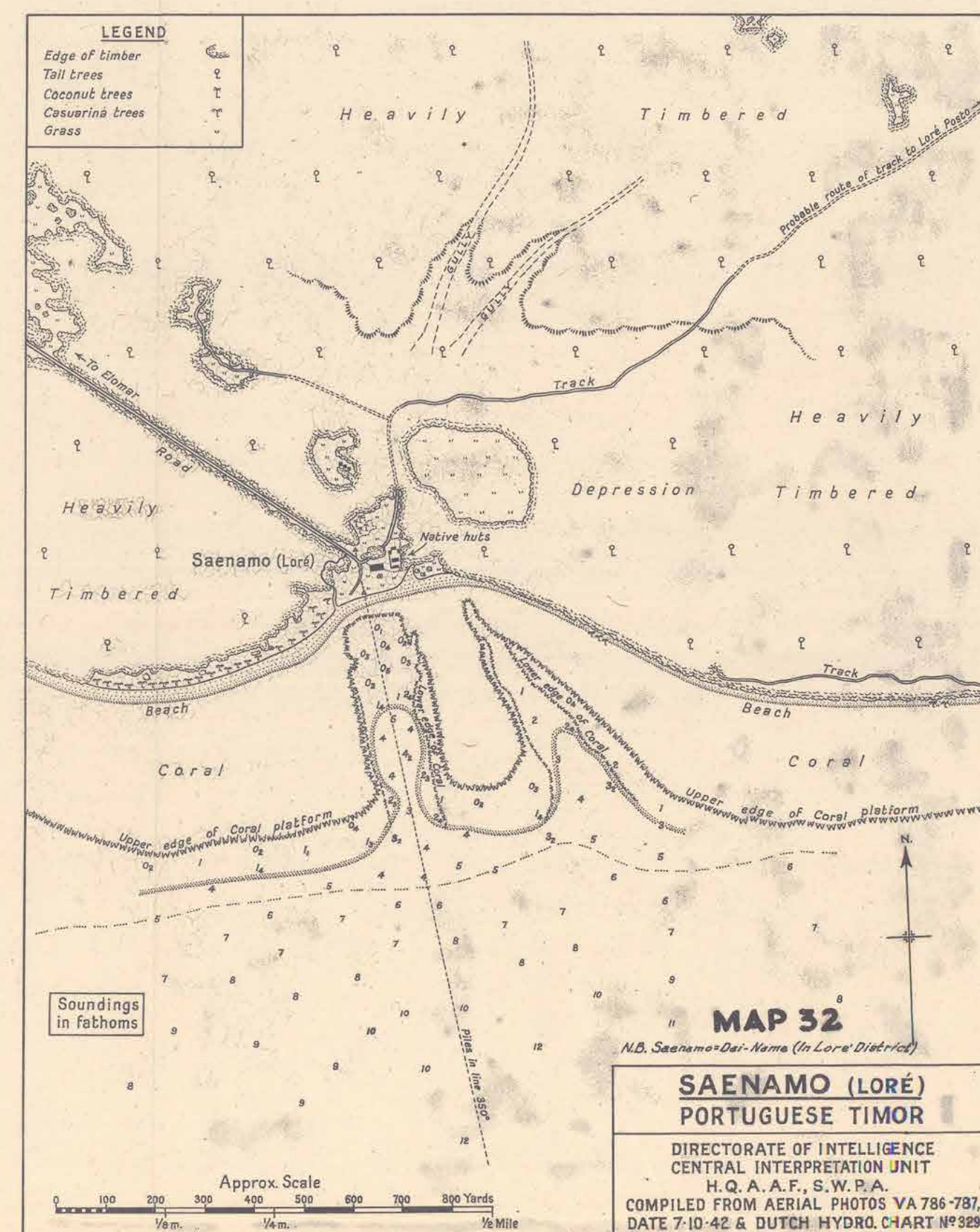
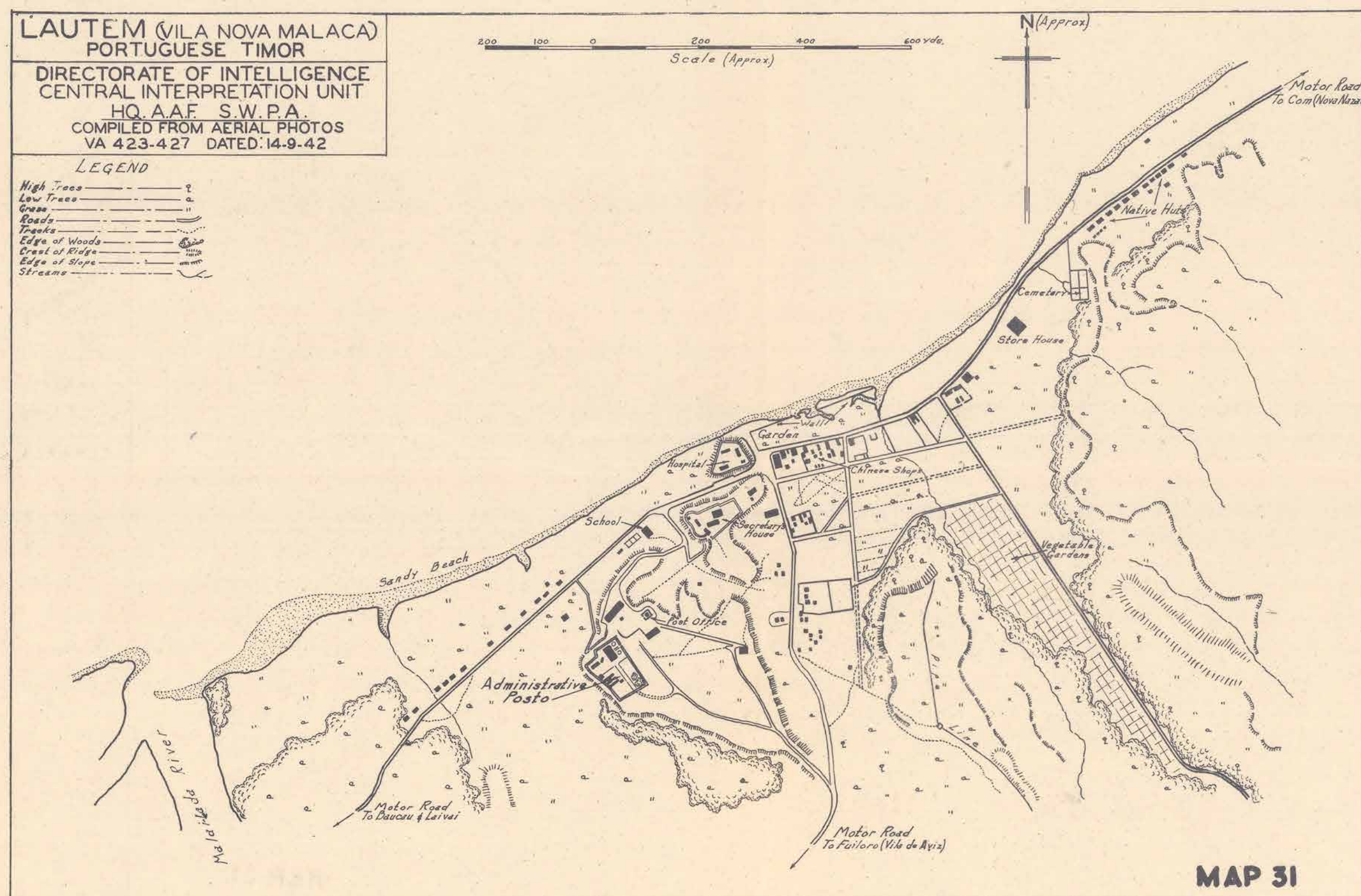
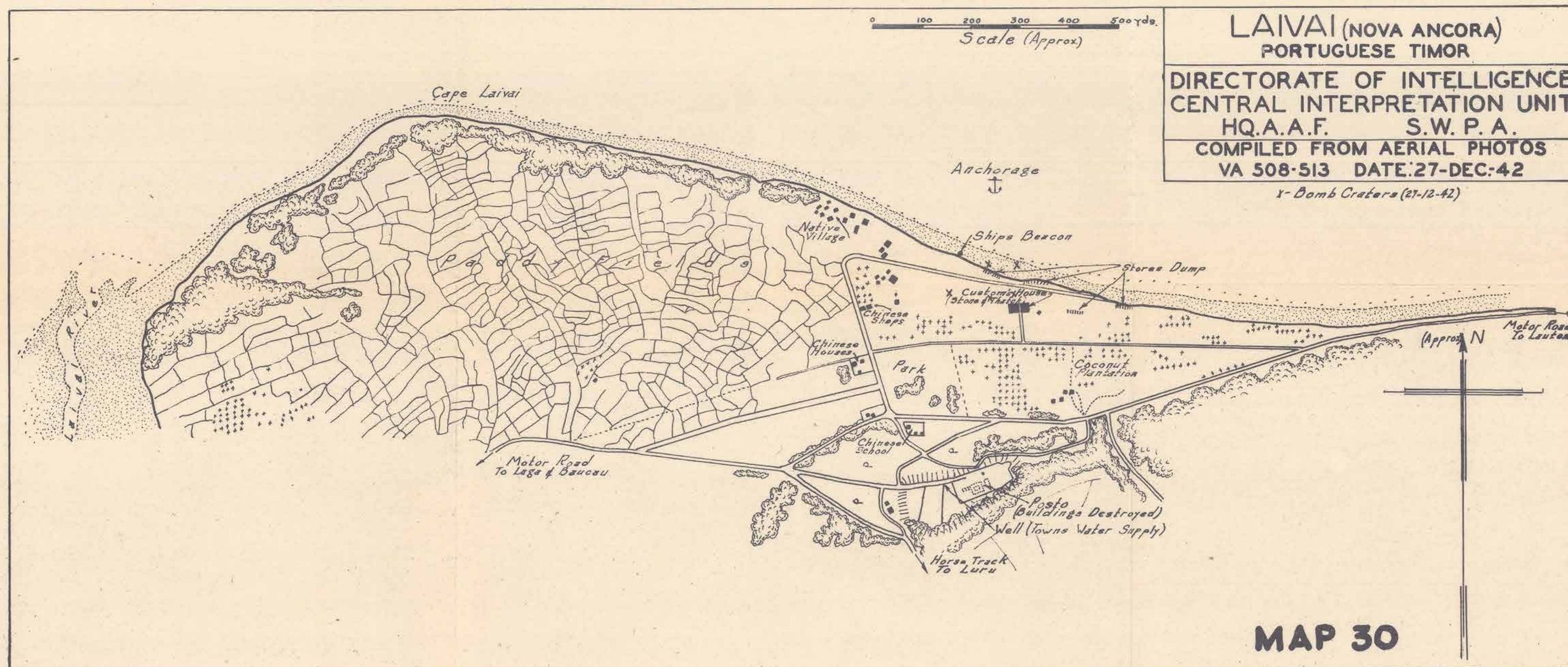
COMPILED FROM AERIAL PHOTOS
VA-410-415 DATE: 17-11-42
PHOTO INTERPRETATION SECTION AAF. SWPA.
ALLIED GEOGRAPHICAL SECTION SWPA.



MAP 25







MAP 33 TO BE ATTACHED
TO THIS PAGE

CORRECTIONS AND/OR ADDITION REPORT

TERRAIN STUDIES

It is particularly requested that you forward to this Section any comments, corrections or suggested amendments to this or previous Terrain Studies. Copies of maps, sketches or photographs are also required. It is essential that you state the source and degree of reliability of your information, e.g., personal recce., compass traverse, verbal report from District Officer, etc.

TO: Allied Geographical Section, South West Pacific Area, A.P.O. 500

FROM: Name.....

Rank.....

Appointment.....

The following corrections, additions and/or recommendations are suggested for Terrain

Study No. :

Date.....

