Numerous shoals lie westward of Nembawewe Reef. Vessels proceeding from Humbolt Bay to Hollandia Bay should pass eastward of the reef.

10-265 HOLLANDIA HARBOR (Sukarnapura) is built around the shores of Hollandia Bay and Challenger Cove. The residences of the Europeans are situated on the higher portions of Tanjong Kajoe Batoe. A new city, being built in 1951 about 15 miles inland near the shores of Lake Sentani, is known as Hollandiastad. A road runs from the harbor area to this town. Hollandiastad is now the capital and principal port of West New Guinea. The population (1960) was about 18,000, of which about 9,000 were Europeans.

WHARVES.—Manthan Oil Jetty, located at the head of the bay, is about 110 feet long and has a depth of 20 feet alongside.

Overseas Whart No. 1 is 330 feet long and has a depth alongside of 24 feet.

Overseas Wharf No. 2 is 460 feet long and has a depth alongside of 30 feet.

Ocean Wharf has a length of 435 feet and a depth of 30 feet. This pier and the two offshore piers are located in the southeast part of the harbor.

It was reported that a new wharf, capable of accommodating 12,000-ton vessels, was completed in 1960.

Water of good quality can be obtained at all of the above wharves, in any quantity at the rate of 20 tons per hour. Limited supplies of fuel oil are obtainable.

One tug, a mooring boat, a pilot boat, and one 20-ton lighter are available. There are three self-propelled mobile cranes of 15-, 5-, and 4 1/2-tons capacity in the port area. One 5-ton crane is available on Manthan Oil Jetty.

REPAIRS at local machine shops are somewhat limited.

HOSPITALS for civilians in the area, have a total of 160 beds.

COMMUNICATION facilities include local telephone service and radio stations. Air service connection can be made at Sentani Airport. Vessels call here regularly.

10-266 COAST FROM HUMBOLT BAY TO TANAH MERAH BAY.—Between these bays the coast trends in a west-northwesterly direction for a distance of 26 miles. There are many conspicuous rocky points with sandy beaches between. On some of these beaches are native villages. A swell exists along the coast, and suitable anchorage cannot be obtained.

The mountains back of the coast consist of three distinct sections, each having a different aspect. The eastern section consisting of four summits has the appearance of a plateau, 4,593 feet high. The Cycloop Mountains form the central section. This section is the highest, as Mount Sor, a triple peak, is 6,745 feet high. The western section is composed of the Dafonsero Mountains, consisting of four peaks. The western section is separated from the central section by a conspicuous summit, 5,046 feet high, surrounded by a lower area.

10-267 TANAH MERAH BAY is entered westward of Tanjong Tanah Merah, a peninsula 311 feet high. The bay is deep and clear, and does not afford anchorage along its open shore on account of a heavy swell. Only in the two inlets in the southern part of the bay can one find safe anchorage for large vessels. These two inlets are formed by a fairly high peninsula which projects from the southern side of the bay. An emerging and discoloring reef extends north-northwestward from the extremity of this peninsula, and Kwakeboh Island is the outermost of the islands lying on the reef. This island can be seen very distinctly from Tanjong Tanah Merah.

TELOK DEPAPRE, the eastern inlet, as a rule is very quiet, and only a northwest wind will cause a swell. The coastal reef in the inlet is usually discolored. In the western cove of the inlet there stands a lone and conspicuous tree. At the extremity of the peninsula is the village of Bitiajo (Tablanoesoe) and farther southward is Sablie. The village of Depapre is situated at the mouth of the Oloflet River, which flows into the head of the bay.

10-268 CHINCHAN BAY (Telok Demen-

gong), the western inlet, is quiet during all seasons of the year. Anchorage in 22 fathoms may be obtained three-eights of a mile westward of a small wooded islet situated at the head of the inlet. At 400 yards west of this islet is a very shallow reef that projects from the shore. The village of Temingoh is situated southward of the anchorage.

COAST.—From the western entrance point of Chinchan Bay the coast trends about 6 1/2 miles in a northwesterly direction, and then 1 1/2 miles in a westerly direction to the eastern entrance point of Iris Bay. The first section has numerous indentations, and native villages are situated on the small sandy beaches of some of them.

ROCKS.—Daidokopa, a rock above water, lies 1 mile northward of Tanjong Hadimoko, the eastern entrance point of Iris Bay. Two patches with least depths of 18 feet and 15 feet lie close northward and one-third of a mile northward, respectively, of the rock. These patches sometimes show a slight discoloration.

Close northward of Tanjong Hadimoko is a small group of protruding rocks. About 1 mile east-northeastward of these rocks are the Kiakebo rocks, and they also protrude above the surface.

The channel between Daidokopa Rock and the rocks lying off Tanjong Hadimoko is deep and clear.

10-269 IRIS BAY is of no importance as far as navigation is concerned. Unprotected anchorage with good holding ground may be obtained at any desired depth. Landing in the bay is difficult. The village of Boekisi is situated at the head of the bay. Eastward of the village the Maroeboe River flows into the bay. With a calm sea and high water boats can enter the river.

MOERIS BAY, entered 4 1/2 miles west-northwestward of Daidokopo Rock, does not afford protected anchorage and is of no navigational importance. During calm weather anchorage with good holding ground may be obtained at any desired depth. Landing is not difficult. The village of Moeris Besar is situated at the head of the bay. A depth of 11 fathoms exists outside the 10-fathom curve in a position almost one-half of a mile eastward of Tanjong Ande.

10-270 REEFS.—Selean Segara, a large reef with least depths of 9 feet to 15 feet, lies with its center about 2 miles northeastward of the eastern entrance point of Moeris Bay, and extends 1 mile in a northwesterly and southeasterly direction. This large reef is surrounded by deep and clear water, and the 9-foot spot on the reef is discolored.

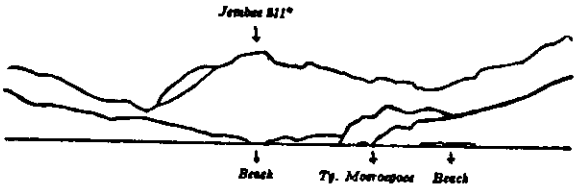
About midway between this reef and the eastern entrance point of Moeris Bay lies a 16-foot patch, which sometimes shows a discoloration. At a distance of 1 3/4 miles eastward of the same entrance point exists a 39-foot patch. Both of these patches are surrounded by deep and clear water.

A very conspicuous gap seen through the entrance of Moeris Bay, bearing 219°, leads northwestward of the above mentioned reefs. The highest summit of the Dafonsero Mountains in range to the rear with Daidokopo Rock (sec. 10-268), bearing 110°, leads between the 16- and 39-foot patches on one side and the shore on the other side. Daidokopo Rock, bearing 127° to the rear, guides one between the reef Salean Segara and the patches.

10-271 DEMTA BAY, lying close northwestward of Moeris Bay, is separated from it by a peninsula, the extremity of which is Tanjong Ande. A reef fringes the entire peninsula. A reef with a least depth of 6 feet, extends about 700 yards northward from Tanjong Ande. BEACONS mark the reef's edge on each side of the bay. However, the beacons have been reported unreliable. Several islets lie on the reef northward of Tanjong Ande. The west side of Poelau Besar shelters the bay from the heavy northerly swells. This affords secure anchorage, but mooring is recommended. The northern side of the island is fringed by a reef. During northeasterly winds a light swell penetrates into the bay, but does not affect the loading or unloading of vessels.

Tides.—The mean high water interval at Demta Bay is 7h. 19m.; springs rise 3.9 feet, neaps 3.4 feet.

10–272 Directions — Anchorage. —When coming from the eastward Tanjong Moeroegoee, the western entrance point of the bay, in range with Majee, a sharp 2,218-foot peak situated southwestward of the head of the bay, bearing 234°, until the 1,981 foot summit of Jembee, about 1 mile southeastward of Magee, is in line 211°, with the head of the bay, then steer 211° until about 500 yards northeastward of Tanjong Moeroegoee, then shape a midchannel course to the anchorage, using care to avoid the reef which extends eastward from Tanjong Moeroegoee. A dry rock is situated on this reef. After that sight on the beacons in order to keep in midchannel.



Flat top of Jembee in range with beach, bearing 211°.

A vessel remaining for a long period of time should moor. When the eastern entrance point bears east, turn to port and drop the starboard anchor in 11 fathoms near the eastern shore reef. Continuing the turn drop the port anchor in 11 fathoms near the western shore reef. In this manner a vessel rides comfortably at a distance of 164 feet from each anchor. However, there is always this objection—that the land wind (see sec. 10–255) causes the vessel to swing, and as a result the anchors may work loose.

10–273 Settlement.—This settlement, situated at the head of Demta Bay, so far has no name and should not be confused with the village of Demta in Matterer Bay. A representative of the Government and a garrison of military police are stationed here. There are also traders, as various jungle products are exported. There is a stone pier for boats. This pier was reported to be in poor condition in 1956.

10–274 Tanjong Kamdara (*2°19′ S., 140°07′ E.* [redacted]), situated 1½ miles westward of the northwestern point of Besar Island, is a low point. Coming from westward one can recognize the point by a square-shaped 295-foot hill, situated 1½ miles southwestward. Close southward of the hill is a ridge attaining an elevation of 394 feet. Southeastward of the latter there is a short 1,453-foot ridge, an off-shoot of the mountain range lying southward of Matterer Bay. When steaming eastward this mountain range does not become conspicuous until Matterer Bay is quite open. The village of Tarfia is situated on the point.

Matterer Bay lies between the western side of Besar Island and Tanjong Kamdara. The

bay is fringed by a reef which greatly reduces the area, and this reef extends three-fourths of a mile eastward from the western entrance point. A detached reef with a depth of 1 fathom lies in the center of the bay. A heavy swell, which penetrates into the bay, is encountered on both sides of the entrance. The village of Jaugafsa is situated on the eastern shore and Demta at the head of the bay.

The bay, which is open to the northward, does not afford suitable anchorage, as during the entire year one will experience either northwesterly or northeasterly winds.

10–275 THE COAST FROM TANJONG KAMDARA TO THE WAKDE ISLANDS.—This section of the coast is low and consists of broad beaches, usually of white sand, but sometimes of a darker color. Back of the sandy strip there is an uninterrupted jungle with coconut trees here and there. Marshy land exists between the jungle and the mountains in the interior. The coast line does not present any good landmarks, but there is an abundance of conspicuous points in the hereafter-discussed mountains and off-lying islands.

10–276 Aspect.—The Irier Mountains, extending north and south, approach the coast westward of the Wakde Islands. Basbassi, 2,257 feet high, is the highest peak of this range, and is very conspicuous when seen between west and south-southwestward. Northward of Basbassi is a 2,001-foot peak, which is conspicuous when it bears west.

Nine miles southward of Basbassi is located an isolated 2,001-foot peak, which makes a good landmark when it bears southwest. This peak lies northward of the western end of the hereafter discussed Gauttier Mountains, and can be of importance when the higher mountains in the interior are enveloped by clouds.

Eastward of the isolated peak lie the Sidoearsi Mountains, 2,296 to 2,788 feet high. This range is also conspicuous when it bears west. A small group of lower hills lies close eastward of the range, and is separated from the coastal hills of Walchenaer Bay by the valley of the Biri River.

Southward of the isolated peak lie the Gauttier Mountains. The highest peak of this lofty range attains an elevation of 7,454 feet. The Gauttier Mountains are connected to the eastward by a high ridge with the Foja Mountains an equally high range. Although located far into the interior both of these ranges can be clearly distinguished on a clear morning.

The Foja Mountains are connected with the Karamoor Mountains, which lie farther eastward, by a lower ridge. The two highest peaks of the Karamoor Mountains are 3,536 and 3,789 feet high.

10–277 Walchenaer Bay [redacted].—Between Tanjong Kamdara and Tanjong Wiroewai, about 29 miles westward, the coast recedes slightly to the southward and forms Walchenaer Bay. A vessel can follow the coast, usually marked by surf, at a fairly close distance. When the sea is calm, anchorage may be obtained anywhere outside of the ground swell which occurs near the shore. Tanjong Wiroewai is more or less conspicuous on account of the mouth of the river by the same name. Several rivers flow into the bay and are of no importance to navigation.

10–278 Coast.—From Tanjong Wiroewai the coast trends for a distance of 44 miles in a west-northwesterly direction to the meridian of the Wakde Islands. This entire low coast is known as Takar, the western part being called Tanah Toem. One can safely follow the coast line with the aid of the lead. With a calm sea anchorage may be obtained anywhere. Numerous native villages are situated along the coast.

The many rivers which flow into the sea along this coast are unimportant and cannot be entered by boats, except the Biri River, which originates in the Foja Mountains and discharges into the sea 18 miles west-northwestward of Tanjong Wiroewai. At high water and with a calm sea this river can be entered by boats. The lower part of the river has numerous bends, and at a distance of 6 miles on a straight line from the mouth the river turns into a mountain stream.

10–279 **Off-lying islands and dangers.—Kaitjebo and Mengge** are two islands which lie about 5½ and 8½ miles, respectively, northwestward of Tanjong Wiroewai and about 1¾ miles offshore. The latter island is low and rocky, and the former is nothing more than a wooded sandbank. These islands can be seen at a considerable distance on account of their high trees. The rough sea around the islands makes anchorage impossible.

Mopkai and Warko, two reefs having a depth of 3¼ fathoms, lie one-half of a mile northward and 1 mile north-northwestward, respectively, of Kaitjebo Island, which is also surrounded by shoal water. Neither of the reefs show a discoloration.

10–280 **Podena Islands.**—This group of islands consists of Anoes, Jarsoen, and Podena, lying in an east and west direction. The islands are low but have fairly high trees. Anoes, the eastern island, is situated 4 miles northward of Mengge Island, and has a reef with depths of less than 5½ fathoms extending 1¼ miles north-northwestward from its northern end. There are clear passages between the islands, except for a 32-foot spot located one-fourth of a mile eastward of Jarsoen, the middle island. On account of rollers there is no recommended anchorage. Drinking water is not available, and most of the inhabitants have moved to the mainland.

10-281 **Jamna Islands** *(2°01'S., 139°15'E.)*, situated about 14 miles northwestward of Podena Islands, consist of two islands named Jamna and Mademo, the former being the northern and larger of the two. Both islands are low and covered with coconut trees. The eastern side of Jamna is fringed by a reef. Near the northern end of the western side of Jamna there is a small cove, near which is the village of Baroean where drinking water is available. On the southern side of the island are the villages of Noemketa and Soiso. At Mademo one finds the villages of Aftoeane and Saoe.

10-282 **Reefs.**—A reef with a depth of 6 feet lies ½ mile northward of Jamna. A reef with 6 fathoms over its north end lies about 1¼ miles northward of the island. An 8-foot patch lies about ¼ mile southwestward of the west extremity of the island. This patch is slightly marked by discoloration. A 23-foot patch lies close southward of it. A 13-foot patch and a 21-foot patch lie about ½ mile southeastward and ¾ mile eastward, respectively, of the northeast extremity of Jamna. A 19½-foot patch lies close west of the above 13-foot patch. The shoals off Jamna are frequently marked by rips; with the wind against it, the sea appears to break over the 6-fathom reef described above.

The southern half of the passage between Jamna and Mademo is encumbered with reefs. A 2¾-fathom patch lies one-third of a mile southeastward of Mademo. Two patches, situated close together and having depths of 2¾ and 3 fathoms, lie about 1¼ miles southwestward of Mademo, about midway between the island and the mainland.

Anchorage can be taken in the bight southeastward of the northwest end of Jamna, and also farther offshore in about 8 fathoms. There is a very irregular current, but it never attains a velocity greater than 1.5 knots.

10–283 **Masi Masi** is a low island situated 6 miles westward of Jamna Island and 1¾ miles off the mainland. The island is covered with coconut trees, 171 feet high. On account of a heavy swell there is no anchorage.

Reefs.—About midway between the island and the mainland there is a patch with a depth of 2½ fathoms. Two miles eastward of this patch lies Sefieri, a rock projecting above the water. A patch with a depth of 1 foot lies 3¾ miles westward of the northern end of the island, and another patch with a depth of 3 feet lies 1¼mile northwestward of it. The sea does not break on the last

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two patches, nor do they show a discoloration.

10-284 **Wakde Islands** consisting of Insoemoar and Insoemanai, situated close southward, lie 7½ miles northwestward of Masi Masi Island and about 1½ miles off the mainland. Both islands are low, but the coconut trees on Insoemoar attain an elevation of 135 feet. A Japanese trading company maintains a settlement on the southwestern side of Insoemoar. Vessels make occasional calls. A signal station is located on the western end of Insoemoar Island.

Reefs.—A reef with a depth of three-fourths of a fathom is situated 1½ miles westward of the western end of Insoemoar, and another reef with a depth of 1 fathom lies 3 miles west-southwestward of the same point. These two reefs may show a slight discoloration, and at times the sea breaks on them.

A shoal with a least depth of 22 feet lies about 820 yards southeast of the southeastern end of Insoemoar Island.

The southern point of Masi Masi Island, in range with the northern point of Insoemanai, bearing 117½°, leads close northward of the three-fourths of a fathom reef.

10–285 **Anchorage.**—Good anchorage may be obtained between the two islands in depths of from 6½ to 7 fathoms. There is no swell, and the currents are irregular and never attain a velocity greater than 1.5 knots. Vessels can easily leave the anchorage at night and reach the open sea by rounding the western end of Insoemoar Island. The best anchorage is reported to be northwest of the Wakde Islands in depths of 20 to 30 fathoms.

It was reported (1944) that Niroemoar Island, Masi Masi Island, Insoemoar Island, and the penisula of Sarmi, on the mainland about 9 miles south-southwestward of Niroemoar Island, are good objects for taking bearings.

The general anchorage area is located between the islands and the isolated reefs westward, while vessels discharge cargo in the small bay formed by the southwestern side of Insoemoar Island on the northern side of Insoemanai Island. Good coral and sand holding ground was found in each of these places.

It was reported that at times winds and swells make working cargo difficult, if not impossible, at the "discharging" anchorage.

Another report in 1944 stated that for a vessel approaching from the westward Insoemoar and Insoemanai Islands appear as one. The best time to arrive or depart from from this harbor is at low tide, when reefs can be seen. It was stated that there is room in the harbor for but one large vessel.

10–286 **THE COAST—FROM WAKDE ISLANDS TO CAPE D'URVILLE.**—This entire coast is low and flat and consists of broad, sandy beaches of a dark color. In back of the beaches there are high trees of a uniform height. Far into the interior rise the Van Rees Mountains, 3,281 feet high.

10–287 **Coast.**—Between the Wakde Islands and the peninsula of Sarmi, 16 miles west-northwestward, vessels may follow the coast at a rather close distance, taking care to avoid the two reefs situated westward of the Wakde Islands. Anchorage may also be obtained off the coast.

The Tor River flows into the sea 6 miles westward of the Wakde Islands. The eastern point of the mouth is easily identified by a high group of trees. With calm weather and high water the river can be navigated by boats. At times the river discharges a considerable amount of muddy water into the sea, causing a discoloration for 4 or 5 miles from the coast. The dividing line between the river water and the sea water often identifies itself by heavy current rips, which even have the appearance of surf.

The village of Sawar is located 8 miles west-northwestward of the mouth of the Tor River, and between them the Irier Mountains (see sec. 10-276) approach the coast. Behind the village rise vertical coral rocks, 98 to 131 feet high. Depths of less than 10 feet extend about 600 yards off the mouth of the Tor River.

10-288 **Maffin Bay** *(1°58'S., 138°52'E.)* indents the coast about 1½ miles westward of the mouth of the Tor River. The master of a vessel reported in 1944 that close inshore in Maffin Bay ships anchor in approximately 7½ fathoms, and farther out in the bay in 36 fathoms. There is a deep gully running through the harbor bottom near the center of the bay and ships must be careful not to anchor in this area, as the depth ranges from 45 to 60 fathoms. The mud and sand holding ground in the harbor is good. There are no tides and very little wind in the bay; the seasonal winds are from the southeast and east. There is a fresh wind outside the harbor and it causes small swells inside.

10-289 **Sarmi Anchorages** *(1°51'S., 138°45'E.)* is formed by a peninsula which extends two-thirds of a mile in a northeasterly direction from the coast. The peninsula is fringed by a reef which extends about 350 yards from its northern extremity. Some high, conspicuous trees grow on the peninsula.

Islets.—Poeloe Sawar and Poeloe Sarmi are small islets lying 1½ miles south-southeastward and nearly 1 mile north-northwestward, respectively, of the north end of the peninsula. Both islets are wooded and fringed by a reef.

Reefs.—A detached 6-foot reef lies about 1/3 mile eastward of the north side of the peninsula. A drying reef, only slightly marked by discoloration when submerged, lies about ¾ mile southeastward of Poeloe Sawar.

Wreck.—A wreck lies about ½ mile northwestward of Poeloe Sawar. Its south side is marked by a buoy.

Anchorages.—There is good anchorage off either side of the peninsula, the depths varying between 4½ and 6½ fathoms, mud and sand. On the northwestern side a vessel is well protected against the southeast monsoon. During the northwest monsoon some swell is felt off the southeastern side. A boat pier, on the southeast side of the peninsula, extends over the reef. Landing can be effected throughout the year.

Current.—A current may be encountered around the extremity, but in the bends the water is quiet.

Tides.—The mean high-water interval at Sarmi Anchorages is 7h. 19m.; springs rise 3.9 feet, neaps 3.4 feet.

10-290 Sarmi is the name of the settlement situated on the peninsula. A representative of the Government is stationed here. There is a pier for the use of boats. Provisions are scarce and can only be obtained in limited quantities. Vessels make regular calls.

10-291 Off-lying islands.—Koemamba Islands, lying in a northwesterly and southeasterly direction, are situated from 9 to 16 miles northward of the peninsula of Sarmi. They form an important landmark on the through route from Geelvink Bay to the 141st meridian. The group is composed of two hilly islands, Liki, 1,070 feet high, and Niroemoar (Armo), 469 feet high, with the little rocky island of Lamsoetoe in between.

The islands are situated on a plateau which is separated from the mainland by a deep passage. The depths on the plateau are irregular, and numerous patches exist in the southwestern parts of the two passages between the islands, the least depth being

4¼ fathoms. The patches hardly ever show a discoloration. Vessels with a considerable draft are advised not to use either passage.

Currents of from 3 to 4 knots have been reported to set westward around the southern tip of Niroemoar Island.

10–292 Coast.—Between the peninsula of Sarmi and Cape d'Urville the depths are regular and shoal gradually toward the shore. The coast should not be approached closer than 3 miles in the vicinity of Cape d'Urville, as a bank fronts the entrance of Matabori and the mouth of the Mamberamo River. Anchorage is available along the coast. During the northwest monsoon there is a heavy surf, which makes landing impossible.

10–293 Tanjong Verkami, situated 5 miles northwestward of the peninsula of Sarmi, is the western point of the mouth of the Verkami River, which cannot be navigated by boats. The tanjong is made conspicuous by a group of high trees protruding above the surrounding foliage. The trees can be easily sighted at night and make a valuable landmark for vessels approaching Sarmi from westward.

Between the Verkami River and Matabori, 46 miles west-northwestward, many other unimportant rivers flow into the sea and are difficult to recognize, such as the Matewar, Noewilala, Wai Moear, Iramoear, and Apauwar. Matewar, situated 6 miles westward of Tanjong Verkami and on the eastern side of the river by the same name, is the only village along this section of the coast.

The Apauwar River flows into the sea about 31 miles west-northwestward of Tanjong Verkami. A small bank in the entrance makes it impossible for boats to enter. The river itself can be navigated by native proas as far as the spurs of the Gauttier Mountains.

10–294 Matabori, which can be easily recognized, is a deep inlet formed by the mouths of the Nanesi and Wasimai Rivers. The western entrance point is covered with high trees, while the eastern entrance point is covered with low trees. There is a small, shallow bay behind the peninsula which forms the western entrance point. The fairly large village of Mataboor is situated on the northern shore of this bay.

The least depth in the inlet is 19 feet. A shoal having a least depth of 5 feet lies 2½ miles off the entrance. There is no definite channel through the bank, and the depths on the bank are constantly changing. Small vessels can cross the bank at high water and with a calm sea. At low water an ebb current of 4 knots may be encountered in the inlet. There is a rough sea if the wind blows in the opposite direction.

A moderate east-southeasterly current has been experienced along this coast. Large tree trunks are frequently encountered.

10–295 Cape d'Urville *(1°28′ S., 137°55′ E.),* located about 5 miles northwestward of the western entrance point of Matabori, is a landmark of great importance to navigation. Since the entire coast from the Koemamba Islands to Geelvink Bay is low, the protruding position of this cape makes it conspicuous. The high trees which grow on the extremity make it all the easier to recognize. In addition, when the cape bears south-southwest, the wide mouth of the Mamberamo River is in view.

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10–296 Mamberamo River which flows into the sea close westward of Cape d'Urville, is one of the largest rivers in New Guinea. It is formed by the junction of the large Van der Willigen River and the Idenburg River. The Mamberamo River flows with many rapids through a gap in the Van Rees Mountains, after which, a little way above the Rombebai Lake, it enters the large flat coastal area. The greatest recorded difference in the water level of the river below Marine Falls (100 miles above the mouth) has never been greater than 13 feet.

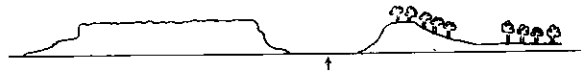
The 100-fathom curve approaches the mouth of the river to a distance of 2½ miles in a decided narrow inward bend, from which leads a wide and deep channel to the mouth of the river. This channel is bordered on both sides by the steep edge of the coastal bank which consists of mud and sand. Near the inner end of the channel lie two mud banks with depths of 18 and 21 feet. There is a deep channel on either side of these banks. The depths on the bar which lies across the mouth vary between 23 and 30 feet.

The river has been safely navigated by a surveying vessel a little beyond the islands of Kerkhoven and Morris. An anchor should be kept in readiness when navigating the bend at the islands, as a cross current may be encountered. A short vessel with a draft of 8 feet or less can hardly proceed beyond the Marine Falls. The vessel must also have powerful engines (speed not less than 10 knots), as at Scholten Island and Havik Island there are strong rapids and whirlpools.

Current.—The river water discharges as a thin surface current with a velocity of 4 knots at low water and 2½ knots at high water. Vessels with a moderate or large draft should take into consideration the quiet salt water which underlies the surface current in the channel.

A current setting north-northeasterly with a rate up to 1½ knots, was observed from Cape d' Urville and westward through Japen Strait until clear of the islands, in 1945.

Caution.—The mouth of the river is subject to constant changes. During the southeast monsoon much silt is deposited, while during the northwest monsoon the surf causes erosion.



MOUTH OF MAMBERAMO RIVER
FROM 4 MILES NORTHWARD

10–297 Directions.—A vessel approaching the river from westward will have difficulty in recognizing the mouth. The high trees on Cape d'Urville in that case make an excellent landmark.

When about 4 miles northward of Cape d'Urville, bring the first outer point on the western bank of the river in range with the inner point on the eastern bank, bearing 202°. Steer on this range until the group of high trees on Cape d' Urville bear 131°, when make good a course of 180°, taking into consideration the north-northeasterly tow of the surface current. This course leads close westward of the 21-foot and 18-foot patches lying close outside the entrance.

When the farthest visible point to the westward is shut out by the western entrance point of the mouth, steer for the inner point on the eastern bank, bearing 207°, until the first outer point on the western bank is abeam, after which keep to the western bank.

10–298 Coast.—From the delta of the Mamberamo River the coast trends for about 55 miles in a southwesterly direction to Tanjong Dombo (Dombo Island). Fresh water

may be obtained at a depth of 3 feet in the sandy beach which runs along the coast. Behind the beach is low marshy land, divided by rivers which are connected with each other. The rivers have no navigational importance as their mouths are all closed by sandbanks. The coast is similar to the delta of the Mamberamo River in that it is subject to constant changes.

Mabri Hill, 554 feet high, is located 9 miles east-northeastward of Tanjong Dombo. The summit of this conspicuous hill is covered with trees.

The depths are regular and shoal gradually toward the shore. There are no dangers except the bank which fringes the delta of the Mamberamo River. During both monsoons the sea is rough in the vicinity of the delta.

10–299 ISLANDS IN THE APPROACH TO GEELVINK BAY.—Geelvink Bay is fronted by two strings of islands, separated by Japen Strait; the northern string consists of the Schouten Islands and the southern string of Koeroedoe, Japen, Miso Noem, and Noemfoor. These islands are heavily wooded and sparsely populated. They serve as a barrier against the high seas of the South Pacific Ocean and afford some shelter to the bay and Japen Strait.

Currents.—See section 10–356.

10–300 Koeroedoe (Abere) Island (*1°50′ S., 137° 00′ E.*), lies 3 miles northwestward of Tanjong Dombo, the strait between them being known as Dombo. This hilly island is about 6½ miles in length in an east and west direction and attains an elevation of 554 feet. Between the middle of the north coast of the island and its eastern extremity a bank, defined by the 5-fathom curve, projects northward for a distance of about 4 miles. A spit with a least depth of 3 feet lies on the eastern side of this bank extending about 1¼ miles from the northeastern extremity of the island.

Anchorages.—Anchorage can be taken off the village of Kaipoeri, located near the middle of the south side of the island. Vessels can also anchor westward of the 3-foot bank, mentioned above, about 1 mile off the village of Koeroedoe. During the northwest monsoon there is a swell at both anchorages. Landing cannot be effected.

10–301 Koeroedore Strait, nearly 4 miles northeast-southwest, is deep and clear of dangers. However, reefs extend ½ mile to ¾ mile from Tanjong Rainbawi and Tanjong Kori on each side of the strait. With good visibility the strait is navigable at night. Dombo Strait, eastward of Koeroedoe Island, is comparably narrower and is shallow in its approaches. Care should be taken to avoid mistaking Dombo Strait for Koeroedore Strait. Soundings should be taken.

Shoal.—A 29-foot shoal lies about 9 miles southward of Tanjong Rainbawi, the east end of Japen Island.

Current.—The current in Koeroedoe Strait sets constantly southwesterly, which during springs, has a velocity rate up to 3½ knots.

10–302 Japen Island situated westward of Koeroedoe Island and separated from it by Koeroedoe Strait, is about 90 miles in length in an east and west direction and has an average breadth of 10 miles. An uninterrupted high chain of mountains extends along the entire length of the island. It attains a maximum elevation of 4,908 feet about 29 miles from its east end, then slopes gradually at its east and west ends, about 6½ miles west-northwestward of its summit is Boempekki, a sharp peak 4,183 feet high, which is prominent from northward and southward. The 5-fathom curve follows the coast rather closely.

Tanjong Rainbawi, the east end of Japen Island, is a low point of land with coconut plantations in its vicinity. A light is shown from Tanjong Rainbawi. The light is surmounted by a diamond-shaped daymark.

A rock with a depth of 3 feet lies about 600 yards southward of Tanjong Rainbawi.

Currents.—Along the southern coast of the Japen Island the tidal currents run in an easterly or westerly direction and never attain a velocity greater than 1 knot. This is also true close off the northern coast of the island, but farther northward a vessel comes under the influence of the monsoon drift current.

10–303 South coast of Japen Island.—Samberbaba Bay lies 12½ miles west-southwestward of Tanjong Rainbawi, the low eastern extremity of the island. The coast between is low and covered with trees. Two conspicuous hills are situated near the coast about 5½ miles westward of Tanjong Rainbawi. A tongue of land, 846 feet high, forms the western side of the bay.

A rock, with a depth of 3 feet, lies about 600 yards southward of Tanjong Rainbawi. Two detached shoals with depths of 6 and 8 feet, about 1 mile offshore, lie about 9½ miles west-southwestward of Tanjong Rainbawi. Shoals with depths up to 5 fathoms extend almost 2¼ miles offshore within this area.

Samberbaba Bay is entered on the east side of Tanjong Tekopi. Anchorage can be taken in 10 fathoms at the head of the bay. This anchorage is secure except in case of a dry warm wind from the mountains, known locally as a "wambrau." The village of Samberbaba is situated at the head of the bay, and there is a small pier for boats.

10–304 Randowaja Bay lies 10 miles west-southwestward of the western entrance point of Samberbaba Bay and extends about 3 miles inland in a northwesterly direction.

Vessels can anchor off the entrance and within Radowaja Bay, 9½ miles west-southwestward of Tanjong Tekopi. The anchorage off the entrance is effected by the "wambrau".

An 11-foot shoal lies about 1/3 mile southward of Tanjong Arrareni. This anchorage is also affected by the "wambrau".

10–305 Ambai Islands [redacted] composed of three large islands and numerous smaller islets, lie 9 miles westward of Randowaja Bay and extend 5½ miles southward from the coast. Ambai, the middle and largest island, is the most conspicuous. The island has three hills lying in a north and south direction. The middle hill is the highest, and all three are separated from each other by a deep valley. Saweru (Saweroe), the western large island is lower and slightly rolling. A chain of three smaller islets extends in a south-southeasterly direction from its southern end. Monoparaiapi, the eastern large island, has a rounded profile, and Oerang Kaitoei, the most southern islet, is saddle-shaped.

Anchorages.—Protected anchorage may be obtained off the village of Saweroe, lying near the middle of the eastern side of Saweru Island. A patch with a depth of 2¼ fathoms is situated close eastward of the village. During the west monsoon anchorage should not be taken farther northward, as the vessel will be subject to sudden gusts of wind coming from the northwest.

Protected and spacious anchorage may also be obtained off the northern side of Monoparaiapi Island. This anchorage should be approached around the eastern end of Monoparaiapi Island, as a 1-foot patch exists in the channel between Monoparaiapi Island and Ambai Island.

10–306 Seroei Bay (Serui Road) (*1°54′ S., 136°15′ E., plan of H. O. Chart 2934*) is entered 3½ miles northwestward of the southern end of Saweru Island. The western side of the bay is formed by a high peninsula ending in two steep rocky capes. The peninsula which forms the eastern side of the bay is an off-shoot of Tafel van Seroei, a conspicuous table-topped hill. This 1,043-foot hill is an excellent landmark both from westward and eastward. When approaching the bay from southward or south-southwestward Tafel van Seroei does not stand out so well, but the Ambai Islands then furnish an excellent landmark. In the entrance the Chinese settlement at the head of the bay can be seen without any difficulty.

The small, rocky, and wooded islet of Mawampi lies about one-fourth of a mile southward of the eastern entrance point of the bay.

Anchorage.—Protected anchorage in 17½ fathoms, mud, maybe obtained at the head of the bay, southward of the boat pier. A wambrau, a dry warm wind from the mountains, may strike from the southward during the east monsoon, and cause a high sea to run into the bay.

Light —Jetty.—A jetty, located close westward of the boat pier, has a light displayed from its head. In 1948 the pier was reported unfit for use.

Tides.—The mean high-water interval at Seroei Bay is 7h. 10m.; springs rise 6.7 feet, neaps 5.3 feet.

10–307 Seroei (Serui) is the name of the settlement located at the head of the bay. A representative of the Government and a garrison of military police are stationed here. The government buildings set some distance back of the shore and are difficult to make out. The village of Mandripo with a Chinese settlement lies close eastward of Seroei. Vessels make regular calls.

10–308 Coast [redacted].—From Seroei Bay the flat and sandy coast trends for 19 miles in a west-northwesterly direction to Janoesi Island, the eastern entrance point of Kanawa Bay. Tanjong Woroei, 7 miles west-northwestward of Seroei Bay, is covered with high trees; and Tanjong Pandoeami, 2¾ miles farther westward, is also wooded. There are some waterfalls behind the village of Mariarotoe, situated 3½ miles northwestward of Tanjong Pandoeami.

The coast is clear of dangers, except for a 1¾-fathom shoal lying 3 miles southeastward of Janoesi Island and about 1¼ miles off the coast. A 2-fathom coral patch is located off the coast about 1 mile south of Tanjong Woroei. Good anchorage, even though it is a little way from the shore, may be obtained off the five villages situated along the coast. The bottom consists of mud.

10–309 Kanawa Bay [redacted] is entered immediately westward of Janoesi Island. Anchorage may be obtained eastward or westward of Oewandeipi, a reef islet lying in the entrance. The charted village of Sasawa is not visible from the bay, and the village of Kanawa is built on poles in the water on the western side.

Papoema Bay lies westward of Kanawa Bay and is separated from it by a peninsula. The best approach is from the southward, after which a vessel may be guided by the discoloration of the reef which fringes the eastern shore.

Two patches, lying close together and having a least depth of 1 foot, are located 1¾ miles westward of the eastern entrance point.

Paroemi is the next bay lying westward of Papoema Bay. An islet lies on the dry reef which extends three-fourths of a mile southward from the eastern entrance point, and two islets on the dry reef which extends 1¼ miles southeastward of the western entrance point. A detached patch with a depth of 1 foot lies 1¼ miles southward of the western entrance point, and close northward of the patch there is shoal water extending one-half of a mile westward from the dry reef.

10–310 Koeran (Kuran) Islands, three in number, lie about 9 miles southwestward of Janoesi Island, the eastern entrance point of Kanawa Bay. Bawei, the largest and southernmost, is 495 feet high. About half a mile northeastward, joined to it by a reef, is Karoeati, a low and saddle-shaped islet, on which there is a small settlement and a coconut plantation. Anchorage in 29½ fathoms may be obtained eastward of Karoeati. Noeiri, the third island, lies 1 mile northwestward of Bawei, and there is a deep passage between them. A reef extends one-half of a mile northeastward from the island, and a detached patch with a depth of 1½ fathoms is located one-half of a mile northward of the island.

Shoals.—A patch with a depth of 2¾ fathoms lies 4¼ miles east-northeastward of Karoeati, and another patch with a similar depth lies 2¼ miles north-northwestward of Noeori.

10–311 Manupampi (Manoepampi) Island (*1°48′ S., 135°48′ E.* [redacted]) is a rocky and wooded island situated 6¼ miles westward of Janoesi Island. The tops of the two hills on the island are conspicuous when seen from the eastward or westward.

Northward of the island there is an emerging reef extending 1 mile in a north and south direction. On the southern end of this reef lies Noewowa, a small islet. A detached patch with a depth of 1½ fathoms is situated one-half of a mile westward of the islet. The channel eastward of the large emerging reef is somewhat obstructed by another small emerging spot situated eastward of the northern end of the reef.

Shoals.—Two 1¾-fathom shoals lie 3 and 5½ miles, respectively, westward of the middle of the western side of Manupampi Island.

10–312 Ansoes Anchorage (Ansus Road) is a winding channel between the mainland and the two islands, Ansoes and Keiari, situated northwestward of Manupampi Island. The village of Ansoes is situated at the bend of the channel.

The western channel to the village between Ansoes, the southern island, and the mainland has several bends and projecting coastal reefs which often cannot be recognized on account of the dirty water. A vessel should wait until low water or engage a native **pilot** from the village.

The eastern channel between the islands of Ansoes and Manupampi is much easier to navigate. As a rule the reefs here discolor quite well, and the channel itself is straighter.

Directions.—When approaching Ansoes Anchorage from the westward, steer a course of 100° by bringing the southern point of Ansoes Island in range with the northern point of Manupampi Island. This course leads southward of the reefs which extend southward and southwestward from Tanjong Maraiworeh, the northern entrance point of the western channel. Keep on this course until near Batoe Pendita, a group of rocks lying one-fourth of a mile westward of Ansoes Island, after which shape a course to enter by the western channel or the eastern channel by rounding the southern side of Ansoes Island. A reef with two islets extends two-thirds of a mile southward from the southwestern point of Ansoes Island.

10–313 Coast [redacted].—From Ansoes Anchorage to Jaimaria Bay, 10 miles west-northwestward, the coast is very irregular and has several bays of no importance. Janusi (Janoesi) Island is located about 5 miles west-northwestward of Ansoes Anchorage. A shoal with a depth of 1 fathom is situated 1¾ miles southwestward of the island, and an emerging reef lies about midway between them. Another emerging reef lies 2½ miles westward of the island.

The best entrance to Jaimaria Bay (*plan on H. O. Chart 2937*) is between Kariori Island, situated in the western part of the bay, and the first of the two islets lying eastward of it. An emerging reef extends one-half of a mile southeastward from Kariori, and shoal water with a depth of 1¼ fathoms extends 350 yards northwestward from the islet on the opposite side of the entrance. Drinking water may be obtained from the mountain stream which plunges over a ledge into the bay.

10–314 Wooi (Wui) Bay (*entrance, 1°41′ S., 135°31′ E.* [redacted]) is entered about 5 miles westward of Jaimaria Bay. The coast at the entrance is rocky, but farther in there is a low sandy beach. The wooded little rock of Aroja (Aroya), situated two-thirds of a mile westward of the western entrance point and on the coastal reef, is not easy to identify. The village of Wooi is situated close northwestward of the entrance. Vessels make regular calls.

Anchorage in a depth of 24½ fathoms, mud, may be obtained northeastward of the village.

Current—Directions.—A fairly strong current sets across the entrance of the bay, so it is necessary to gauge accurately the speed of the vessel so as to ensure sufficient way. This can be done with safety as the fringing reef on either side discolors well.

Vessels should approach the bay with Marai, a double-peak summit northeastward of the bay, bearing 037½°. On this bearing only one peak with a half moon depression is in view.

10–315 North coast of Japen Island [redacted].—Between the eastern extremity of the island and Tanjong Marapa, 50 miles westward, the coast is low and covered with coconut trees; thence to Serewen Bay, about 21 miles westward, it becomes high and steep; thence almost to the village of Saribi, 9½ miles westward, it becomes level again; thence to the western extremity of the island it is high and rocky. This coast is less populated than the southern coast and is seldom visited by vessels. More or less suitable anchorage may be obtained in the bends at some of the small villages.

10–316 Pom Bay (*1°37′ S., 135°42′ E.* [redacted]) is a small inlet situated 17 miles eastward of Tanjong Woka, the western extremity of the island. The coastal reef extends 350 yards westward of the eastern entrance point and some dry rocks are situated on it. Anchorage in the center of the bay at a distance of 218 yards from the fringing shore reef may be obtained in a depth of 24½ fathoms.

The large village of Pom is built on the drying reef on the eastern side of the bay. On the western side of the bay there is a pier for boats. Some Chinese traders live in the vicinity of the pier. Vessels call occasionally at the bay.

10–317 Off-lying islands and shoals.—Aibai and Mios Indi, 2½ miles eastward, are two low islands located 8½ miles northeastward of Pom Bay and 6½ miles off the northern coast of Japen Island. Both islands are densely covered with high trees and make good landmarks at a considerable distance. During favorable weather anchorage in a depth of 20 fathoms may be obtained southsouthwestward of the village of Samberi situated on the southern side of Mios Indi.

The passage between the fringing reefs of these two islands and between the islands and the northern coast of Japen Island is free of dangers. The shallowest spots in the latter passage are a 4¼-fathom patch lying 5 miles southward of Aibai and 1½ miles off the coast, and a 5-fathom patch lying 5½ miles south-southeastward of Mios Indi and 2 miles off the coast.

10–318 Mios Noem (Mios Num) Island [redacted] situated 7½ miles northwestward of the western extremity of Japen Island, is about 15 miles in length in an east and west direction. The island is densely wooded and hilly throughout its entire length. There are no permanent villages on the island.

Pono Kabai Islands, three in number, lie close off the eastern extremity of the island. There are deep channels between the narrow emerging reefs which fringe the islands, except for a 3¾-fathom spot located in the center of the group. Fairly strong currents make it unsafe to proceed in between the islands.

Two rocky islets, situated close together and named Slamiapien, lie 1 mile off the western extremity of the island.

Anchorage.—The northern coast of Mios Noem has two bays situated close together. Papiai Bay, the western one affords good anchorage in a depth of 38 fathoms, sand. A 4¼-fathom shoal lies about 1 mile northwestward of the entrance. Both bays can be easily entered by keeping to the middle of the entrance. On the south coast of Mios Noem it is too steep to anchor.

10–319 Mios Noem (Mios Num) Strait [redacted] separating Mios Noem from Japen Island, is deep and clear, except for a depth of 7½ fathoms located 4¼ miles eastward of the northern Pono Kabai Island. Vessels can navigate the strait at night without any difficulty. Tanjong Woka, the western extremity of Japen

Island, is rocky and steep, and can be approached very closely insofar as the current will permit.

Currents.—Only tidal currents are encountered in the strait. Their maximum velocity is from 2 to 2½ knots.

10–320 Swandei (Sewandeh) is a densely wooded islet, 341 feet high, situated 4½ miles westward of the western extremity of Mios Noem Island. An emerging reef extends 1 mile northwestward from the islet. Numerous rocks, some of which are wooded, lie on the reef.

A plateau with irregular depths extends westward from Mios Noem Island and almost joins the mainland. There are some shoal depths on this plateau westward and northwestward of Swandei. None are less than 5½ fathoms, and their position can best be seen on the chart.

Swandei Strait, separating Swandei from Mios Noem, is spacious and clear of dangers, and can be navigated at night. In the strait and also on the plateau westward of Swandei there are tidal currents having a maximum velocity of 2 to 2½ knots.

10–321 Noemfoor (Numfor) Island (*1°00′ S., 134°53′ E.*), situated 24 miles north-northwestward of the western extremity of Mios Noem Island, has a flat appearance and rises just westward of its center to a height of 669 feet. This wooded island is fringed by a wide reef. At some of the villages along the coast openings for boats can be found in the outer edge of the reef which dries at low water. Dangers exist close off the edge of the reef on the southeastern side of the island, and also close off the southwestern coast on either side of the entrance to Telok Roemboi the only open bay on the island.

The little island of Manim, located near the western coast, although low, can be sighted at a considerable distance on account of its high trees. It is separated from the main island by a clear and deep channel.

A light is shown at the village of Jenmanoe, on the northwest side of the island.

Banks.—A bank with a least depth of 36 fathoms by fathometer has been reported about 10 miles northward of Noemfoor Island.

Soundings indicate a bank with depths of 40 fathoms extends about 5 miles in a 293° direction from a point close northward of the 36-fathom depth referred to above.

10–322 Anchorages.—Anchorage in depths of from 13 to 19 fathoms, coral and sand, may be obtained in Telok Roemboi. There is a little pier for boats.

On the northwestern coast about 2 miles southwestward of the northern extremity of the island one may anchor off the village of Jenmanoe in more than 19 fathoms, sand, with the conspicuous house bearing 180°. This anchorage lies close to a boat passage in the coastal reef, and the passage is not difficult to find.

Three miles northward of the village of Bawe located in a bay on the eastern coast there is an opening in the coastal reef. Menggari and Saoeribroe, two villages, are located on the coast close south of the opening in the coastal reef. There is a pier off each of the above two villages. Anchorage may be taken off this opening in a depth of more than 19 fathoms, sand. From the opening a passage leads inside the coastal reef to the village of Bawe, and it can be used by motor boats at high water.

The outer edge of the coastal reef on the northern and southern sides of the island shelves gradually, and anchorage may be obtained off the reef.

During the "Wambrau" (sec. 10–356) the anchorages on the western and southern coasts are not entirely safe, and it would be preferable to anchor along the northern coast.

Beacons.—Three sets of range beacons lead through the opening and passage inside the coastal reef north of Bawe. The first set in range 229° leads through the opening in the reef. The second range in line 192°, leads from the entrance range southward; the junction of these two ranges is marked by a buoy, painted in yellow and black vertical stripes. The third range; in line about 149°, leads south-southeast from the second range. There are additional beacons on both sides of the channel leading south to Bawe. A buoy, painted in yellow and black vertical stripes, is moored close north of Menggari.

Tides.—The mean high-water interval at the village of Jenmanoe is 7h. 19m.; springs rise 4.9 feet, neaps 3.9 feet.

Currents.—A marked deviation from the main direction of the drift current (sec. 10-356) takes place in the vicinity of Noemfoor Island. On both sides of the island the current runs toward the south (west monsoon) or toward the north (east monsoon). It has been reported that during the east monsoon an east-northeast-going current runs along the southern coast of the island instead of a west-going current. The maximum recorded velocity of these currents is 2 knots.

Weather.—During the survey from June to October, a "Wambrau" (sec. 10–356) from the southwest was experienced twice during the first part of August. Both times it blew with a strong velocity for a period 3 to 4 days, after which the wind again came from southward to southeastward. At the end of September there often were northerly winds, causing a swell along the northern coast of Noemfoor Island. There also was much rain accompanied by thunder. The rain lasted only a few hours each time, but was of such a nature as to reduce the visibility to 1 mile.

10–323 Schouten (Misori) Islands situated northward of Japen Island and separated therefrom by Japen Strait, a wide and deep passage usually used in navigating along the north coast of New Guinea, consist of the two large islands of Soepiori and Biak, almost joined together, and on the northwestern side the separately located little islands of Bepondi and Ajawi, and on the southeastern side of the little archipelago comprising the Padaido Islands. The two large islands are mountainous, and the smaller ones are low and hilly. Nearly all of the islands are covered with high trees.

Currents.—During the northwest monsoon the east going drift current divides into two branches westward of the western extremity of Soepiori Island. One runs along the northern sides of Soepiori and Biak Islands, and the other first in a southeasterly direction between Noemfoor Island and Soepiori Island and then east and northeast through Japen Strait. Off the last-mentioned branch another branch runs in a north-northeasterly to northeasterly direction along the southeastern coast of Biak Island. This branch again joins the east going current at Tanjong Wararisbari, the eastern extremity of Biak Island.

During the southeast monsoon the opposite occurs. The current which runs in a northwesterly direction along the northeastern coast of Biak Island curves well northward of Soepiori Island, and as a result there is no current for a distance of 3 or 4 miles off the coast.

The maximum recorded velocity of these currents is 2 knots, although along the southeastern coast of Biak it is as high as 3 knots.

Weather.—The northwest monsoon usually blows with great force and causes a heavy surf on the northern and northeastern coasts of the two main islands. Also heavy westerly squalls, known as "Wamandas", strike the southern coast from the westward and southwestward, and the northern coast from a northerly direction. The wind is not strong during the southeast monsoon although occasionally a "Wambrau" (sec. 10–356) sets in from the southwestward and lasts anywhere from 4 to 8 days. The natives claim that a "Wambrau" occurs only during new moon.

The sky is nearly always overcast during both monsoons, and especially in the vicinity of the equator there is much rain. During the southeast monsoon a heavy fog blankets the sea for months at a time. Land and sea breezes usually set in about 3 hours after sunset and sunrise.

10–324 Ajawi *(0°11′S., 134°59′E.)*, the northwesternmost island of the Schouten group, is covered with trees, 151 feet high. The island is not inhabited.

A bank about 3 to 4 miles wide extends in a northwesterly direction from the island to the equator. Shallow spots on the bank are found principally near the edge and the least

depth on the bank is 3¼ fathoms. The water is very clear and the bottom is visible at depths of 13 to 14 fathoms.

Bepondi Island, situated about 20½ miles southeastward of Ajawi Island, is densely wooded and has two summits, 450 feet high. The island is situated on an extensive bank with a least depth of 5 fathoms. The water on this bank is also clear.

Anchorages.—Anchorage in a depth of 11 fathoms may be obtained off the village located on the southwestern point of the island. This village is only inhabited during the southeast monsoon. Anchorage also may be taken everywhere around the island in depths of from 5½ to 11 fathoms, coral.

Isabel Reef, with a least depth of 2½ fathoms, lies with its eastern extremity 5½ miles southward of Bepondi Island and extends 5 miles in an east and west direction. The reef discolors and is sometimes marked by breakers. There is a deep-water passage between the reef and the bank on which Bepondi Island is situated.

10–325 **Northern coast of Soepiori (Supiori) Island** (*H. O. Chart 2932*).—The coast can be approached rather closely, and vessels should pass northward of the islands near the coast. There are no dangers outside of the 110-fathom curve which runs on an average of between 1 and 2 miles off the coast. During the southeast monsoon no drift current exists off the coast.

The most conspicuous mountain is Boembeffor, a 2,789-foot peak with a white rocky part at a 2,070-foot elevation southeast of it.

Tanjong Orimbori (Imbieri), the northern point of the western extremity of the island, is steep, rocky, and reddish in color. Tanjong Orimbori can be passed at a close distance northward, but the western and southwestern approach is dangerous on account of off-lying shoals.

10–326 **Islands and reef.**—Eastward of the open bay of Npiesndi, situated immediately eastward of Tanjong Orimbori, the coast to and including Waboedori Bay is indented in odd shapes and is fronted by shallow spots and emerging patches on which are located the three islands of Mios Pandi, Mios Woendi and Mios Poeri. These islands are covered with high trees. The navigation of the waters between and in back of Mios Pandi, Woendi, and Poeri is not advisable on account of the many emerging reefs. East of the islands the coast is fringed by a wide emerging reef as far as Tanjong Bosensbari, close eastward of the eastern entrance point of Waboedori Bay.

A reef with a least depth of 3¾ fathoms extends 3½ miles westward from Mios Pandi, the western island. Southward of this reef there is a deep channel leading up to Mios Pandi. Fando and Fanda, two conspicuous rocks, lie in the middle of the channel about 2 miles westward of Mios Pandi. About midway between the rocks and the island is situated a 2¾-fathom patch.

10–327 **Anchorage—Directions.**—Suitable anchorage in a depth of 7 fathoms, sand, may be obtained south-southwestward of Mios Pandi (*plan on H. O. Chart 2936*). In order to reach this anchorage approach the coast 1 mile eastward of Tanjong Orimbori and then steer with Tanjong Keroemansoen bearing 113°. Tanjong Keroemansoen is a rocky point northward of the 1,181-foot hill situated on the main shore southwestward of Mios Pandi. When southward of Fanda, the southern conspicuous rock, steer with the southern extremity of Mios Poeri, the easternmost island, bearing 102°. As soon as the western coast of Mios Pandi bears 030° drop anchor.

10–328 **Waboedori Bay** is entered about 5 miles eastward of Mios Poeri. The western entrance point is low and has a village built on poles in front of it, and the eastern entrance point is hilly. Both points are fringed by emerging reefs, which reduce the width

of the entrance to 435 yards. Inside the entrance the bay takes the form of a perfectly round basin with a radius of 765 yards outside the 5½-fathom curve. Close westward of the center of the bay there is an emerging spot with steep sides. The village of Waboedori is situated on the beach at the southwestern corner of the bay, and the small sandy island of Oerjowi is located at the southeastern corner.

Anchorage—Directions.—The bay offers at all times a safe and quiet anchorage place. Vessels not having local knowledge should wait for low water before entering. When a vessel is in the narrow entrance, it can steer with the western side of Oerjowi Island bearing 184°. As soon as the village of Waboedori bears 245° steer for it on that bearing. The anchor can be dropped in a depth of 13½ fathoms at a distance of 660 yards from the village. In this position a vessel will lie 330 yards southward of the steep emerging spot.

10–329 **Kepoedori Bay,** with the village of the same name, lies close east of Waboedori Bay, but it is only available to boats and small craft.

Janim Bay, about 2 miles eastward of the above bay and with Tanjong Bosensbari midway between them, is also small and only available to boats and small craft. At its head is the village of the same name.

Wafordori Bay, 2¼ miles farther to the southeastward, is a spacious bight which affords good anchorage in 11 fathoms over mud and sand. The dangerous coastal reef extending from the eastern entrance point must be avoided, however.

10–330 **Sorendidori Strait,** seperating Supiori from Biak, is a narrow creek of no importance, and is not visible from seaward. Its northern part can only be navigated by proas at high water. Anchorage can be found in the bight at the northern end of the creek, just east of the entrance. An impassable inner bay with two small islands in front of it will be noticed on closer approach. There is anchorage in about 20 fathoms at 875 yards from the alignment of the two islands, or in 34 fathoms about 380 yards from the shore at the northern entrance to the creek.

10–331 **Northeast coast of Biak.**—Vessels can navigate close along this coast as there are no dangers outside the 100-fathom curve which lies at a comparatively short distance offshore. The projecting points along the coast are chiefly steep and rocky and constitute good landmarks; the large rocks on the shore reef at the northern end of the island are also good landmarks.

At the northwestern end of the island is a group of mountains of which Manseren Baken and Somboenen, 2¾ miles southeast and 2½ miles south of Tanjong Praisbari, rise to 2,428 and 2,280 feet, respectively. Otherwise the northeastern side of the island has a flat appearance with a slight incline to the northwestward and a few hills in places.

10–332 **Tanjong Praisbari** (*0°41′ S., 135°49′ E., H. O. Chart 2932*), the northern extremity of the island, is comparatively low, but the land rises immediately within it. A rock lies on the drying reef extending from the point. The coast between this point and Wari Bay is densely populated, but no suitable anchorages can be recommended. Landing can be effected most anywhere during the southeast monsoon. A government official and a detachment of armed police are stationed at Warsa, a village 9½ miles southeast of Tanjong Praisbari.

A waterfall (a light-colored rocky wall during the dry season), on the northern slope of the 1,247-foot hill east of Warsa, constitutes a good landmark.

10–333 **Wari Bay** (*plan on H. O. Chart 2936*), with the village and a small river of the same name, lies 8 miles southeast of

Warsa. Small vessels will find fairly good temporary anchorage near the 11-fathom curve during the southeast monsoon. The drying shore reef at the eastern entrance point is wider than that at the western entrance point.

Korim Bay, south-southeastward of Wari Bay, is an inlet nearly one-half of a mile wide between limestone rocks. Tanjong Snerisbari, the eastern entrance point, is rocky and steep. The sides of the bay are also steep, and the depths decrease gradually towards the head so that anchorage can be taken in almost any desirable depth between 11 and 2¾ fathoms. It is clear of dangers and safe during the southeast monsoon, but a swell is felt occasionally. A narrow channel with a least depth of 4 feet leads to a lagoon near the southwestern corner of the bay. A long drying reef divides the lagoon into two channels which have a least depth of three-fourths of a foot.

10–334 Korim village lies on the southern side of the lagoon, just within the entrance. It has a small pier for boats which can approach it at high water. Fresh water can be obtained.

10-335 **Coast.**—Between Korim Bay and Tanjong Wararisbari (Warari), the eastern extremity of the island, anchorage can not be found anywhere, but landing at the villages is possible during the east monsoon. The coast consists of steep rocky walls in places, and is low in others. Tanjong Wararisbari is low and has a conspicuous rock formation, Mios Mboi, on the drying reef which extends from it.

10-336 **Southwest coast of Soepiori.**—Tanjong Mandoendi, the northwestern extremity of Soepiori, is a spur of a somewhat conspicuous 994-foot coastal hill. This hill is the end of a range which extends southeastward parallel to the coast; the 1,489-foot hill 4 miles to the south-eastward is fairly conspicuous. An extensive plateau with depths of less than 100 fathoms extends 10½ miles westward from Soepiori. Its southwestern side extends parallel to the coast and has a large drying reef at its southeastern end. On the extremity of this reef is Rani, a sandy island covered with coconut trees. Farther northwestward, and also on the reef, are a group of rocky islets of which Insobabi is the largest. A stranded wreck lies on the reef, about 4½ miles west-northwestward of Insobabi. The depths on the plateau are extremely irregular. A 5-fathom patch lies at the southwestern corner, and depths of as little as 3 feet are found close within the edge between it and the drying reef. Within the northern edge of the plateau are patches with a least charted depth of 4¼ fathoms. It is inadvisable to navigate over this plateau.

10-337 **Sowek Roads** *(0°50′S.,135°29′E.)*, 14 miles southeast of Tanjong Mandoendi, may be approached by way of the deep channel formed between Soepiori Island and the large drying reef mentioned with the plateau described above. Near it is a basin formed in the drying reefs which extend up to 1½ miles offshore at this place. The approach to the basin is about 50 yards wide, and marked by beacons. Several islets lie on the reef near it, and close to its inner side is the village of Sowek, built on poles. As the basin can only be entered by boats, larger vessels must anchor off the entrance in 33 fathoms over sand and coral, inside of two shoal patches of less than 1 fathom. A good anchorage will be found with Boensaki, the outer islet on the western side of the basin, bearing 353° and the left side of the village 057°. Near Sowek are two creeks which extend through marshy land to the inner bay of Korido.

10–338 **Korido Bay** extends about 10 miles in a northwesterly direction. Its outer part is deep and clear except for the drying reefs off its western entrance point. The inner part is unnavigable because of the many reefs. Landing beyond the broad drying reef is difficult.

Korido Road Anchorage.—Korido Road, on the north side of the outer part of Korido Bay, affords anchorage in 38 fathoms over coral close southwestward of the break in the reef. Bransfari Islet lies close eastward of this indentation. Vessels should approach the anchorage with the conspicuous roundtopped tree, at Awaki village, in line

with a sharp peak bearing 318°, and anchor when the pier at Korido bears 020°. Small craft anchor closer in. Awaki, located about 1 mile farther northwestward, can be reached by boats through a channel in the reef. A beacon, with a triangle topmark, stands on the southwest end of the reef, close southwestward of Bransfari Islet. A stranded wreck lies close southeastward of the pier at Korido.

10–339 Korido village is located about 4½ miles northwestward of Tanjong Pimonsbari. There is a depth of 3 feet alongside the pier at the village There is occasional communication by sea with ports in Netherlands, New Guinea.

10-340 Coast.—At the southern entrance Sorendidori the coasts of Soepiori and Biak form a large bay which is very deep but clear of dangers. Only at a few places does the coastal reef project. Anchorage is possible only in the vicinity of the coastal reef (marked by discoloration) near the entrance to Sorendidori; this place affords shelter during both monsoons. (sec. 10–347).

10-341 The west coast of Biak has deep water close to it. An exception to this is Japonda Reef, a small drying reef about 2½ miles north of Wardo village, anchorage will be found in 22 to 44 fathoms during calm weather. Drinking water can be obtained from a natural reservoir near the river bank; when this disappears during dry spells water can be obtained at a waterfall 4 miles up the river.

On the northern side of Tanjong Snerisbari is the village of Arnini and a small reef basin with a depth of 12 fathoms, which forms a natural harbor for proas. There is a depth of 2¾ fathoms in the entrance, and outside of it the bottom is too steep to afford anchorage.

Along the coast between Tanjong Snerisbari and Tanjong Sambersbari, 8½ miles to the southeastward, the bottom is too steep for anchorage. About 3½ miles southeast of Tanjong Snerisbari a high gray rock stands out conspicuously.

10–342 The south coast of Biak is generally low and consists of sandy beaches with rising land back of them. On the shore of the bight east of Tanjong Sambersbari are some high white rocks. The many villages along this coast are easily seen from seaward. The dangers along this coast lie comparatively close inshore. When seen from the southward the island has the appearance of tableland, but a steep wall 14½ miles east of Tanjong Sambersbari is conspicuous when seen from the eastward.

10–343 Sorido is a village on the south coast of Biak Island located about 9 miles eastward of Tanjong Sambersbari.

Sorido Lagoon *(1°12' S., 136°04' E.)* lies between the coast and the submerged barrier reef that lies about one-half of a mile offshore. It extends about 4 miles east-southeastward from the village of Sorido. For a distance of about 2 miles westward from its eastern entrance the lagoon is fairly clear, but there is much foul ground in its northwestern part. Sorido Lagoon serves as a commercial port, naval base, and bunkering station.

Commercial activity is centered in the vicinity of Waupenor, at about 1½ miles westward of the entrance. There is a seaplane landing area in the lagoon, close southward of Waupenor. It extends in a west-northwesterly direction for about 1 mile.

The entrance, which is at the eastern end of the lagoon, is about 500 yards wide. A lighted buoy is moored on the western side of the entrance. The eastern part of the lagoon is clear of dangers, having a clear swept depth of 36 feet within the entrance, and to within about 1/3 mile westward of Waupenor.

There is a 39-foot patch close outside the entrance westward of mid-channel. The area from about 600 yards seaward of the barrier reef, southward for about 1 mile and eastward and westward of the entrance for about 3

miles, has a clear swept depth of 46 feet. Several shoal areas lie off the barrier reef, northward of the swept area.

10–344 Two lighted range beacons, located northwestward of the entrance lead in on range 322°. The front beacon is located on Mios Sipoe, a small islet on the drying shore reef. It is white in color and has a triangle topmark with point up. The rear beacon is on the shore, painted red, and has a triangle topmark with point down.

Another pair of similar beacons are located on the shore in the vicinity of the wharf about 1 mile westward on range 294½°. They lead from the intersection with the entrance range, close within the entrance, up the lagoon to the wharf.

Note.—Both pairs of range beacons and the buoy on the western side of the entrance show lights only when a request has been made to the harbormaster 12 hours in advance.

Pilots for Sorido Lagoon must be requested from the harbor master at Hollandia, whence they are flown to the port.

There is a signal station near the lagoon entrance eastward of Mios Sipoe.

Government Wharf, located at Waupenor, is 827 feet long, 90 feet wide, and has a depth alongside of 30 feet. There are two 360-foot berths, the western used for taking on oil. There is a depth of 35 feet alongside the western berth. It is advisable to berth starboard side to and be ready to leave in case of squalls. Vessels of 10,000 tons have been able to use this wharf. There are movable cranes on the wharf of 1–4 tons capacity. One self-propelled floating crane of 12-ton lifting capacity is available. Other smaller wharves in the lagoon are in ruins. The Royal Netherlands Navy has several craft here, including tugs, and a lighter crane of 12 tons lifting capacity.

Cautions.—There are three mooring buoys off the wharf. It is strongly advised that vessels lie slightly off the wharf by running lines to these buoys, because strong winds rise unexpectedly and surge vessels on the wharf.

Keep well off the old wharves in the approach to the wharf as there are a number of submerged objects in their vicinity.

Supplies are not obtainable; water of poor quality can be taken from barges or pipe connections. Diesel oil and gasoline can be obtained.

Scheduled air service to and from Biak is on a weekly schedule; there are several airfields near the harbor and a hotel for passengers. Telephone and radio telephone facilities are available. There is a general hospital in the area.

10–345 Anchorages.—There are several anchorage berths in the eastern part of the lagoon. Seaward of this lagoon is an anchorage area with good holding ground. Vessels approaching this vicinity should use caution, because of strong currents.

Due to the occurrence of sudden squalls vessels should at all times be ready to get under way. During these squalls the harbor is unsafe for small craft. See also section 10–323 in regards to weather.

10–346 Soeanggarai Roads *(1°12′ S., 136° 10′ E.)*, 16 miles east of Tanjong Sambersbari, affords fairly good anchorage for small vessels, even during southwesterly winds. Maidoerip is a small islet on the shore reef northeast of the village; its light green color stands out conspicuously against the dark green rocky wall behind it. Near this islet and between it and Tanjong Faknik (to the northeastward) are two bights in the shore reef with depths of 16 to 22 fathoms; both are protected from the southwestward by drying reefs. A detached drying reef south of Tanjong Faknik also affords some shelter. A 2½-fathom patch lies close east of the detached drying reef which lies south of Maidoerip.

An aviation light is located about 1¼ miles westward of Maidoerip.

To approach this anchorage bring the western end of Owi in range with the eastern end of Roerbas Beba on a 161° bearing astern; Tanjong Faknik will then be just on the starboard bow. When Maidoerip bears 292° proceed on soundings on that bearing, and large vessels can anchor in 22 to 27 fathoms about 800 yards from the islet. Vessels can also continue on the 161° stern bearing and anchor in 44 fathoms when Maidoerip bears 258°. Smaller vessels can anchor farther in, in 23 fathoms, about 250 yards from Maidoerip bearing 323°.

10–347 Bosnik Roads, 4 miles east of Soeanggarai, affords anchorage for moderate-sized vessels in 11 to 22 fathoms about 200 yards off the end of the pier. The slight bend in the coast eliminates the inconvenience of currents, but vessels should be ready to weigh anchor when strong southwesterly winds spring up; Soeanggarai Roads are then preferred. Working cargo is very difficult during the northwest monsoon and Wambraus (of the southeast monsoon), which are southwesterly winds of 4 to 8 days duration. Vessels can find shelter off the north and east sides of Soepiori and Biak. The most conspicuous landmarks are best seen on the chart.

East of Bosnik vessels can navigate close along the coast, but there are no anchorages.

10–348 Bosnik is the chief place of export for the Schouten Islands. A government official and a detachment of armed police are stationed here. There are some Malayan traders. A pier for boats extends out across the drying shore reef. Vessels call at regular intervals. Malaria is quite prevalent.

10–349 Passage between Biak and Padaido Islands.—This passage is 3¼ miles wide at its narrowest point, and is clear except for Woendoemimas, a small 4¼-fathom patch 5¼ miles southeast of Tanjong Warari. This shoal has been swept to a depth of 3¼ fathoms (1960). The best route through this passage is about midchannel between Owi and Biak and then along the Biak shore at a distance of 2 miles. The current sets more or less parallel to the Biak shore, and current rips may be seen most everywhere. A maximum current velocity of 2 knots has been recorded in the month of October.

A rectangular area extending about 1,200 yards northward and westward, and about 1¼ miles southward and eastward, respectively, of Woendoemimas has a clear swept depth of 9 1/3 fathoms.

10–350 **PADAIDO ISLANDS** consist of a large number of wooded islands lying southeast of Biak. Some of them are hilly and vary in height up to 447 feet; others are low and sandy. Drying reefs and shoal banks lie near these islands, surround them, and join some into groups. For the currents near this group, see section 10–356.

Owi *(1°15′ S., 136°12′ E.)*, the westernmost island of the group, 306 feet high, lies 3¼ miles south of Bosnik, on the south side of Biak. This island is inhabited. The village of Adoeëna lies on the southeast side, and there are a few small houses on the north side. There is no anchorage.

Roerbas Beba and Roerbas Wedari are two uninhabited islets 3 miles south of Owi. There is practically no coastal reef, and the channel between them is clear. There is no anchorage.

Auki, Mios Woendi, Pai, Noesi, and a few smaller islets lie on an extensive irregular reef which incloses a lagoon with depths of 3 to 16 fathoms. Auki, the largest island, is 230 feet in height and slightly hilly. Joemni is a round, rocky islet 139 feet high. Mios Woendi, Rarisbari (Oeriv) Konori, and Noesi are low and covered with coconut trees. Pai is the highest, rising to a height of 237 feet. Auki, Mios Woendi, and Pai are inhabited.

10–351 **Mios Woendi Lagoon** is the lagoon enclosed by the above islands. There is a least depth of 29½ feet in the entrance channel but care must be taken to avoid the foul ground and coral heads that lie on the western side of the fairway.

Buoys.—A drum buoy is located on the east edge of a 3-foot coral head that lies in the northwest part of the lagoon. An aero mooring buoy is anchored about 1 mile eastsoutheastward of the southeast end of Mios Woendi.

Dangers.—There is sometimes a strong current setting across the entrance channel, which lies between a 2¾-fathom shoal on the west side and the south end of the reef extending about 1 mile southward of Noesi, on the east side. A buoy marks the west side of the entrance channel.

Caution.—Bombing and gunnery exercises are carried out in an area within 5 miles of Wararasowe Reef; this reef is located about 1 mile southwestward of Konori.

Anchorage.—There is good anchorage in Mios Woendi Lagoon with fair protection from the sea afforded by the extensive irregular reefs. Normal winds are moderate. Anchorage is not sheltered from high winds, however. Vessels with local knowledge can anchor in 10 to 14 fathoms, mud, sand, or coral with good holding ground.

Tides.—The mean high-water interval at Mios Woendi Lagoon is 7h. 4m.; mean low-water interval 0h. 35m.; neap range 2.1 feet; mean range 3.3 feet; and spring range 4.2 feet.

Daily tide predictions for Mios Woendi Lagoon can be obtained by applying the following differences to the predictions for Yokohama as published in Tide Tables, Pacific Ocean and Indian Ocean:

Times of high and low waters—for 150° E. meridian time add 2h. 50m.; for 135° E. time add 1h. 50m.

Height of high and low waters—same as Yokohama.

Currents.—At the entrance to the lagoon a 2½-knot easterly set on ebb tide, and a 1½-knot westerly set on flood tide can be expected.

10–352 Directions.—Vessels should enter the lagoon when the west side of Mios Woendi is in line with Joemni Islet, located about 1¾ miles from its west end, and bearing 332½°. When well within the entrance change course to 027° which leads to the anchorage. As the channel within the entrance is unmarked vessels must proceed with great caution.

10–353 Mios Woerki, about 2½ miles south of Auki, is uninhabited, but there are coconut plantations on it. Wararasowe Reef, which partly dries, lies about 1 mile southwestward of Konori, an islet lying on the southwest side of the atoll near the west end of the group. It shows as a bright white sand bank, and when submerged is clearly marked by discoloration. There is a deep channel, clear of dangers, between it and the reef of the atoll.

Insaroriki Reef, located midway between Pai and Pakriki, has a least depth of 4¼ fathoms. It is usually marked by discoloration and tide rips over it.

Woendoemimas, 4 miles northward of Pai, is described in sec. 10–349.

Pakriki, 444 feet high, is located 3¼ miles eastward of the south end of Pai. The island has a table-topped hill which is prominent.

Rock.—A coral patch with a depth of 2½ fathoms, and a 4½-fathom patch located about ½ mile eastward of it, lie about 8 miles southward of Pakriki.

10–354 Padaidori, Bromsi, Pasi, and Mios Manggwandi are the largest of a string of islands lying on a bank of soundings extending in a north and south direction. These islands are inhabited, and there are several anchorages near them. Padaidori, the northernmost, is 221 feet high, and is surrounded by a broad drying reef.

Bromsi, 447 feet high, has a conspicuous summit. The channel between it and Padaidori has a least depth of 23 feet in the fairway. A strong current runs through this passage.

Pasi is 280 feet in height and has a fairly conspicuous summit. The channel separating it from Bromsi is very narrow, but has a least depth of 10 feet in midchannel. A westerly current of 1 to 3 knots was observed in this channel in October and November of 1930. Suitable anchorage in about 11 fathoms may be found off Pasi village, on the northern part of the island.

Mios Manggwandi, separated from Pasi by a deep and clear channel, is low and sandy at its southern end and 253 feet high at its northern end. A 3-foot reef lies 1½ miles southwest of it, and two wooded islets lie southeastward of it; the southern of these, Rasi, has a light on its southeastern extremity.

10–355 **Noekori, Dauwi, Wamsoi, Roeni,** and a number of drying reefs lie on a bank of soundings 3½ miles east of Mios Manggwandi. These islands are flat and wooded. A drying patch of white sand is seen at times on the southernmost of the drying reefs. Samakoeri is a rocky formation, 122 feet in height, which lies 1½ miles east-northeast of Noekori.

Mios Workbondi, 1½ miles north of Samakoeri, is 184 feet in height. Kassinampia, northward of this island, is a large shoal with a least depth of 19 feet. Oerbinai, eastward of the island, is also a large shoal and has a least depth of 2½ fathoms.

10–356 **GEELVINK BAY** [redacted] lying between Tanjong Dombo and Tanjong Saweba, about 205 miles to the westnorthwestward, is fronted by two groups of islands (sec. 10–299) which afford it considerable protection against heavy seas. During both monsoons, however, rough seas are encountered between the eastern end of Japen Strait and Cape d'Urville.

The east coast of the bay is, in general, low and flat, and a number of large rivers discharge along it. The west coast, on the other hand, is steep and high. The rivers that discharge into this bay discolor the water for a distance of 5 to 6 miles offshore and carry out large trees and other debris which constitute a distinct menace to navigation. Furthermore, the east and south coasts of the bay are subject to such constant change that the lead must be the main reliance of vessels in these waters; it is deemed inadvisable to take a vessel into depths of less than 11 fathoms, particularly in the eastern and southeastern parts of the bay.

The densely wooded shores of the bay are but sparsely settled. The natives live in a very primitive manner. The villages along the coast and on the various rivers consist of houses built on poles. Vessels call at various places along the shores of the bay where jungle products are gathered for shipment.

Weather.—In Geelvink Bay a warm, dry, southwest wind sometimes blows off the western shore, and is known as the "wambraw". As it sets in, the coast temperatures rise considerably, the air becomes very dry and rather hazy at sea level. It has been known to last a week, decreasing slightly in strength at night. It usually blows force 4, but may reach gale force for short periods. It sometimes raises a rough sea in the bay.

Tides.—Along the west shore of the bay there is both a diurnal and a semidiurnal tide, but the latter predominates. The spring lows of the two tides may coincide. As a consequence of this coincidence the lowest water level occurs in December or January and June or July. The maximum rise and fall that can be expected are, respectively, about 2.6 feet above and 3.6 feet below the mean sea level.

Currents.—Fronting Geelvink Bay, in Japen Strait and northward of the Schouten Islands, there are no tidal currents, but there is a weak drift to the eastward during the northwest monsoon and to the westward during the southeast monsoon. The islands,

however, cause some deflection from these general directions. The maximum recorded velocity of this drift is 2 knots, although in the vicinity of the southeast coast of Biak a velocity of 3 knots has been reported.

Inside the bay there are weak tidal currents but no monsoon drift. The general set of the currents is into the bay at flood tide and out at ebb. In the southern part of the bay the currents change about 2 hours after high and low water. The maximum recorded velocity of the currents is 1 knot.

Dombo Strait, separating Koeroedoe Island from the coast of Netherlands New Guinea northward of Tanjong Dombo, is 2 miles wide with depths of 10 to 29 fathoms. The strait is approached from northward in depths of 6 to 7 fathoms and from southward over a bank with a least depth of 3¼ fathoms.

10–357 The coast, trending southeastward from Tanjong Dombo (*1°54'S., 137°06'E.*), to the mouth of the Kariferi River, a distance of 12 miles, and thence west-southwestward to Valsche Hoek, a distance of about 53 miles, is low, swampy, and overgrown with mangroves which are submerged at high water. The 5-fathom curve extends southward from the southern shore of Koeroedoe Island about 6½ miles westward of Tanjong Dombo and fronts the bight thus formed by the coastline, and thence irregularly follows the coastline from 1 to 3 miles offshore. Inasmuch as the land is subject to seaward extensions, by reason of the rapid deposit of silt, alternating with periods of destructive erosion, particularly during the northwest monsoon, the various points, such as Geelvinks Oosthoek, Tanjong Sojo and Tanjong Demba, along this coast are of no value as landmarks. Eastward of the meridian of Geelvinks Oosthoek there are several hills, among which are Mambai, 525 feet high, on which there is a conspicuous tree, Vandori, 922 feet high, and Tolaterri, with a thumb-shaped peak 2,165 feet high. The most important landmark in this vicinity is Kamusopedai, a 3,356-foot elevation situated 30 miles southward of Tanjong Dombo.

Apparently the outermost dangers along this coast are a 1-fathom spot located about 3 miles offshore at a position 21½ miles southwestward of Tanjong Dombo, and a 2½-fathom patch lying 2 miles northeastward of Geelvinks Oosthoek.

Few villages are to be seen close along the shore. The principal coastal villages are Napoeai, near the mouth of the Kai River, close southeastward of Geelvinks Oosthoek; Wonti (Wainoei), near the mouth of the Wonti (Wainoei) River, 9½ miles east-southeastward of Geelvinks Oosthoek; Dombo, on the west side of Dombo Island; and Pamai, on the east side of Dombo Island.

Tidal currents along this coast are weak and irregular. Southward of Dombo Strait the most perceptible current sets northward, with a velocity of 1 knot.

10–358 Anchorage can be taken in mud or muddy sand anywhere along this coast. The preferable anchorages seem to be in depths of 22 to 27 fathoms off Geelvinks Oosthoek and off the mouths of the Kai, Sajati, and Wonti Rivers, all of which empty into the sea between 2½ and 9 miles southeastward of Geelvinks Oosthoek. During the northwest monsoon landing is generally impossible along the coast between Tanjong Dombo and Valsche Hoek.

Valsche Hoek (*2°12'S., 136°25'E.*), consists principally of a hill, 554 feet high, the northeasternmost of a short range of hills near the coast.

10–359 The coast between Valsche Hoek and Jacobus Opdekams Hoek, 50 miles to the southwestward, consists of a wide coastal belt of low, marshy land fronted by a narrow strip of tree-covered sand that is broken in many places by wide river mouths. Inasmuch as the mud banks fronting this coast extend off not more than 2 miles, vessels can proceed along it closely enough to take bearings on the various headlands and the mouths of the rivers.

Among the elevations along this coast that are useful landmarks are three hills, 384, 476, and 607 feet high, respectively, located southwestward of Valsche Hoek; Sanoringga

Hill, 410 feet high, lying 13¼ miles south-southwestward of Valsche Hoek; a group of nine hills, of which the highest, named Olifant, has an elevation of 991 feet and is situated 8½ miles southeast of Olifants Hoek; and Groote Doodkist, a hill 646 feet high, located 5¼ miles southeastward of Olifants Hoek. Farther inshore, at a distance of about 30 miles east-northeastward of Olifants Hoek, is Kleine Kerkberg, a group of mountains consisting of three peaks with elevations of 2,001, 2,024, and 2,234 feet, respectively.

This coast is very sparsely settled; the only village along it is a very small one named Warén, situated at the mouth of the Warén River, 6 miles southwestward of Valsche Hoek.

Anchorage can be taken everywhere along this coast in depths of 16 to 22 fathoms, but during the northwest monsoon these berths can be uncomfortable.

10–360 **The Wai Poga (Wapongga)**, the largest river along this stretch of coast, empties into the sea at a position about 2 miles northeastward of Olifants Hoek. It rises far in the interior and, for the last 50 miles of its course, flows through low marshy plains that are generally flooded during the rainy season. In the lower reaches the width of the river varies between 330 and 440 yards. On the bar there is a depth of 6 feet, but the depths inside increase to 10 or 11 fathoms. At 40 miles above its mouth the river branches into two arms, one rapidly diminishing in depth and width and the other continuing for a considerable distance into the hilly hinterland.

10–361 Naoefi (Nawi) Island *(2°14′S., 136°15′E.)*, lying about 9½ miles westward of Valsche Hoek, is a heavily-wooded island with several peaks the highest of which has an elevation of 325 feet. It is an excellent landmark for the vicinity. The island is surrounded by a drying reef, but outside of that fringing reef there are no dangers.

The coast between Jacobus Opdekams Hoek and Rarewarai Bay, 18 miles to the southwestward, is low and cut by the numerous mouths of the Warenai and Siriwo Rivers. A steep-to bank over which the greatest depth is about 1½ fathoms extends 1 to 1½ miles off this coast. The bottom in this vicinity is generally of mud, but off Jacobus Opdekams Hoek is consists of hard sand and stones.

10–362 **The Moor Islands**, consisting of two large islands, Noeto Roetomordja (Nuto Rutomorja) and Ratewo, and a small islet named Oetaina, lie on a bank of soundings that extends out from a line joining Jacobus Opdekams Hoek and Hooge Westhoek. These islands are heavily wooded and the two larger ones are hilly but have no conspicuous peaks. Noeto Roetomordja has a maximum elevation of 410 feet, and Ratewo, the largest island, has a maximum height of 492 feet. Drying reefs extend out in places from all of the islands. A detached 5-foot spot lies nearly 1½ miles northwestward of the northeastern extremity of Noeto Roetomordja.

The bottom over the bank of soundings on which these islands lie consists of hard mud. The water around them is very dirty and normally contains much debris that has been brought down by the rivers; occasionally small islets consisting of vegetable matter are seen floating around. During the northwest monsoon there is frequently a heavy sea over this bank.

Noeto Roetomordja is the only inhabited island of the group; on its southeast side is Moor village, around which there are extensive coconut plantations.

Anchorage can be taken anywhere around the Moor Islands except to the northwestward of the group, where the bottom rises too steeply. The currents between the islands are sometimes strong.

10–363 **Rarewarai Bay** *(3°02'S., 135°48'E.)* is an inlet formed between Noesariwe Island and the mainland. Tanjong Warisano, the northeastern extremity of Noesariwe Island and the northern entrance point of the bay, is a good landmark, as is also a large tree on the island. The branches of the Siriwo River that empty into the bay make the water very dirty. A drying reef extends out a short distance from Tanjong Warisano. On the east side of the bay is a wide drying shore bank; off the outer edge of this bank, opposite Tanjong Warisano and 1,300 yards off the east shore of the bay, is a patch over which there is a depth of less than 1 foot.

About midway between Tanjong Warisano and Tanjong Oefai, an inner entrance point about 1,100 yards to the southward, there is a small bight in which vessels can anchor in 16 fathoms, mud. In the inner part of the bay, beyond Tanjong Oefai, there are numerous reefs which, because of the muddiness of the water, can not be sighted. A small drying channel leads from the head of the bay around the western end of Noesariwe Island, and thence into Weinami inlet.

10–364 Coast.—From Tanjong Warisano to Nusi Island, a distance of about 11½ miles, the coast takes a general southwesterly direction, but is considerably indented between Hooge Westhoek and Nusi Island. Vessels should exercise great caution in approaching this coast because the water is muddied by sediment carried down by the rivers. Furthermore, in the southern part of this stretch of coast, between Moesairo River and Nusi Island, there are several reefs, some of which dry. A sharptopped hill, 1,116 feet high, situated 1¼ miles south of the entrance to the Moesairo River, is a good mark for the vicinity.

Close southwestward of Noesariwe Island is a peninsula which terminates in Hooge Westhoek, and on which there is a hill 525 feet high closely backing the point; the shores of this peninsula are covered with mangroves except at three small villages, named Weinami, Napan, and Masipawe. Near these villages there are white sandy beaches. The houses at Weinami extend along the shore of the inlet between the peninsula and Noesariwe Island. This inlet is used by the schooners of the Chinese traders who live at Weinami; it is connected by very shallow channels with Rarewarai Bay. Two villages are situated, respectively, at the mouths of the Legare and the Moesairo Rivers. Between these two, on a steep sand and gravel beach, is Makimi village.

10–365 **Nusi** *(3°09'S., 135°40'E.)* is a small, thickly wooded island, 164 feet high, situated close off the New Guinea coast. It is not easily distinguished against the high coastal hills. On the island is a settlement belonging to a European trading company.

Anchorage can be taken in 19 fathoms between Nusi Island and the mainland. Inasmuch as several detached reefs, one of which has only 1½ feet of water over it, lie off the eastern end of the island, vessels should approach the anchorage from the westward.

10–366 **The coast** between Nusi Island and Tanjong Bumi, 19 miles to the southwestward, is low, monotonously wooded, and very sparsely settled. The only villages are at Telok Kimi, a small inlet 1 mile northeastward of Pinkster East Point, and 6½ miles southwestward of Nusi Island, and Nabire village, situated 4 miles eastward of Tanjong Bumi. In Telok Kimi there is good anchorage for small vessels in 8¼ fathoms.

10–367 **The Haarlem Islands** consist of two large and several small islands lying 6¼ to 12 miles westward of Hooge Westhoek. Kopataar *(3°05'S., 135°35'E.)*, Awaar, Koenoer, Her, and Noemini Islands are so grouped as to form a basin about 1½ miles in diameter and 20 to 25 fathoms deep; in the center of this basin, however, there is a 2½-fathom patch. The best entrance to

this basin, which is a safe and spacious anchorage, is from the northward, between the northern end of Kopataar and the reef that projects westward nearly one-quarter of a mile from the northwestern extremity of Awaar; the other entrance channels are somewhat restricted by the reefs and stones that extend from the islands. The maximum elevation of the trees on the principal islands of the group are as follows: Awaar, 361 feet; Kopataar, 328 feet; Her, 230 feet; and Noemini, 213 feet. Roin Islet, situated close off the southeastern extremity of Awaar, is a small, wooded sandbank. Djaoenan, 108 feet high, is a well-wooded islet situated 1¾ miles southwestward of the western extremity of Kopataar Island, near the eastern end of a drying reef about 1 mile long. Waider Islet, covered with high trees, stands at the southern end of a drying reef three-fourths of a mile westward of the western end of Kopataar.

Dangers.—Three reefs, with depths of less than 6 feet, lie between ¾ mile southward and about 850 yards west-southwestward of the east end of Kopataar. Unofficial beacons, which are unreliable, mark the east and west reefs. A drying reef lies about ½ mile southward of the southeast end of Awaar, and a shoal with a depth of 3 feet, lies about 400 yards southward of the southwest end of the same island. A 1-foot patch lies about 3/5 mile southwestward of the west end of Noemini. A 3-foot patch lies about ¾ mile northwestward of Djaoenan, and a 1¾ fathom shoal lies about ½ mile westward of Waider Islet.

A group of houses on the southeastern extremity of Kopataar and on the northern end of Noemini comprise the village of Sihaam. On the northeastern extremity of Kopataar is the village of Boré.

10–368 **The coast** between Tanjong Bumi and Tanjong Hamoekoe, 12 miles to the westward, is low and devoid of conspicuous points. A fairly wide mud bank skirts the shore here and there, but no detached dangers have been discovered along this stretch of coast. Vessels approaching the coast, however, should exercise caution because the mud bottom shelves steeply in many places, the water is, at times, muddied to a distance of 5 or 6 miles by discharge from the rivers, and large, heavy tree trunks may be encountered floating around at a considerable distance offshore. These tree trunks, which often are seen with one end sticking in the mud, are a menace to navigation inside the 5-fathom curve.

Among the villages along this sparsely settled coast are Wanggar, near the mouth of the Wanggar River 5½ miles west-southwestward of Tanjong Bumi, and Hamoekoe, situated 2 miles westward of Tanjong Hamoekoe which is a small but conspicuous point. The Wanggar River can be ascended by flat-bottomed proas for a considerable distance.

Anchorage can be taken in 3¾ fathoms on the bank at the east side of the trough-shaped depression abreast the mouth of the Wanggar River.

10–369 **Coast.**—Between Tanjong Hamoekoe and Tanjong Busurua the coast sweeps around through a westerly, northwesterly, and northerly direction for about 80 miles. It is broken only by a few inlets and by two peninsulas which terminate, respectively, in Tanjong Maniburu and Tanjong Manggoear.

Most of this stretch of coast is rather closely backed by high hills and mountains. Among the more conspicuous of these are the 669-foot hill southward of Tanjong Maniburu, the 3,609-foot Jauer Peak, 6¼ miles south of Tanjong Manggoear, and the high mountain ridge that lies along the longitudinal axis of the peninsula that forms the eastern side of Wandammen Bay; this ridge has numerous peaks the highest of which has an elevation of 7,297 feet. Jauer Peak, one of the most remarkable points in Geelvink Bay, can be seen from all directions at a great distance; the slopes of this peak extend northward to the Drie Gebroeders, 1,312, 1,348,

and 1,404 feet high, respectively, located about 1½ miles southwestward of Tanjong Manggoear; these peaks are good landmarks from the north and southeast. The southern slopes of Jauer Peak connect with a fairly high mountain ridge near the coast about midway between Tanjong Maniburu and Tanjong Manggoear. Southward of this ridge and across the inlet westward of Tanjong Maniburu the land again rises near the coast; the highest peak of this ridge has a flat top and rises to an elevation of 2,336 feet.

Vessels seldom if ever come into this part of Geelvink Bay. The vessels of the K. P. M. do not, as a rule, come farther south than Wandammen Bay.

10–370 Barrier reef—Off-lying dangers.—A chain of islands, reefs, and banks extends from a position abreast the coast about 8 miles westward of Tanjong Hamoekoe to about the parallel of Tanjong Busurua, roughly paralleling the coast at an average distance of about 13 miles. Northward of the parallel of Tanjong Busurua, at which position there is a rather wide break in the chain of dangers, they continue along a northeasterly line to the reefs and islets comprising Mios Aoeri (sec. 10–381). In the daytime the navigation of the area along the eastern side of this barrier reef presents no difficulties.

The southern end of the chain consists of a group of dangerous reefs that extend for a distance of 2 to 4 miles off the shore between Tanjong Hamoekoe and Tanjong Mariburu. Nuburi (Vader Smit) (*3°18′ S., 135°06′ E., H. O. Chart 2932*) is a small, wooded islet situated near the southern end of a drying reef 9¾ miles west-northwestward of Tanjong Hamoekoe and 3 miles offshore. Nu Sariwanni (Leiden) is another small wooded islet that lies on the central part of a drying reef 4½ miles northward of Nuburi; a drying reef nearly 2 miles long lies about midway between these islets. A shoal over which there is a depth of less than 1 foot lies three-fourths of a mile westward of Nu Sariwanni. Karei (Enkhuizer), situated 7 miles northward of Nu Sariwanni, is a large, irregular-shaped drying reef on which are two light-colored sandbanks; between Nu Sariwanni and Karei there are several smaller drying reefs. Noe Tabari, lying 2¾ miles eastward of the eastern edge of Karei and separated from it by a clear passage, is a small, wooded islet on a drying steep-to reef. Aikei, a light-colored sandbank on a drying reef, lies 2½ miles northwestward of the northwestern extremity of Karei.

Kumbur (Hoorn), situated near the center of an elongated drying reef about 3 miles northward of Aikei, is a low, sandy islet which, because of its high trees, is the most important landmark on this part of the barrier reef. A shoal with less than 1 foot of water over it lies one-half of a mile westward of Kumbur.

Pasir Nabadi, a coral reef on which there is a large, light-colored drying sandbank, is located 14½ miles northwestward of Kumbur. Between these two reefs there is a deep passage in which the only danger is a 1½-fathom patch, situated 7½ miles eastward of Tanjong Manggoear.

Angra Meos, located about 11 miles northward of Tanjong Manggoear, is a large, hilly, uninhabited island; it has a maximum elevation of 673 feet but has no conspicuous peaks. The western, eastern, and northeastern points of the island are sandy and covered with tall trees. A detached 4¼-fathom patch lies 3 miles northeastward of the eastern extermity of Angra Meos.

Kaboeai is a low, sandy islet covered with tall trees which make of it an important landmark for the northern end of the barrier reef; it is situated at the southern end of a small, steep-to drying reef 9½ miles northward of the eastern extremity of Angra Meos. Within a distance of 3 miles north-

ward and northwestward of Kaboeai are several reefs on two of which there are drying sandbanks that are marked by breakers at high tide. Westward of Kaboeai are several shoals, all lying within a distance of 4 miles of the islet. A 1-fathom patch lies 1 mile southeastward and a 4¼-fathom shoal lies 3½ miles southwestward of Kaboeai.

Anchorage can be taken near all of the above-mentioned islets except Noe Tabari. All of these islets are uninhabited, but on some of them there are temporary shelters that are used by the natives who occasionally come out to them on fishing expeditions.

10–371 The coast between Tanjong Hamoekoe and Tanjong Maniburu, 19 miles to the northwestward, has three unimportant indentations, the largest and westernmost of which is Toe Wasoi. It is very dangerous to attempt to approach this stretch of coast, because it is fronted by numerous reefs and has not been fully examined.

10–372 Tanjong Maniburu (Maniboeroe) *(3°13′ S., 134°57′ E., H. O. Chart 2937)*, a steep point that is closely backed by a 669-foot hill, is the extremity of the irregular-shaped Kwatisore Peninsula.

10–373 Kwatisoré Bay is an indentation, about 1¼ miles wide, in the west side of Kwatisoré Peninsula immediately southward of Tanjong Maniburu. There are four detached reefs in the south and southwest parts of the bay. Three lie close together about 500 and 800 yards, respectively, north-northwestward of the village. About 800 yards northeastward of the middle of the village lie the third and fourth detached reefs, which have less than 3 feet over them. Kwatisore village is located on the south side of the bay.

Anchorage can be taken in 21 fathoms, soft mud, about 400 yards 259° from the village. This anchorage is unsheltered and the holding ground is poor. In order to avoid easterly squalls which sometimes blow over the lowlands southward of Tanjong Maniburu, vessels should anchor northward of the detached reef in about 22 fathoms.

10–374 Directions. — Vessels bound for Kwatisoré Bay from the northward round Tanjong Manggoear at a distance of at least 1 mile and then steer a course of 180° true until Noemanggoeri Island, situated 6¼ miles southward of Tanjong Manggoear, is abeam, when the 669-foot hill at Tanjong Maniburu, bearing 160°, should be steered for. At that distance the point appears as a small island. This course, on which the peaks of the Drie Gebroeders, located close southwestward of Tanjong Manggoear, are directly astern, is continued until Noesir Islet, situated about 5 miles northwestward of Tanjong Maniburu, is abeam and then course 180° is resumed. When Nu Sariwanni is almost in range with Tanjong Maniburu course is changed to the southeastward in order to proceed to the anchorage.

Vessels coming from the eastward pass through the barrier reef southward of Nu Sariwanni on course 279° and then steer toward Tanjong Maniburu, rounding that point at sufficient distance to clear the 3-foot shoal that lies one-half of a mile northwestward of the point.

10–375 The coast between Kwatisoré Bay and Tanjong Manggoear trends southward, westward, and northward for a total distance of 28 miles; it is fronted by several islands and has a number of indentations the largest of which lies westward of Kwatisoré Peninsula.

Tanjong Womosisoré *(3°06′ S., 134°50′ E., H. O. Chart 2932)*, located 10¼ miles northwestward of Tanjong Maniburu, is a very conspicuous, bare, light green-colored point at the end of a small, low, narrow peninsula. Telok Wororomi, an inlet just south of Tanjong Womosisoré, dries over its greater part. The shores of this inlet, as of those farther

south, are covered with mangrove trees and are practically uninhabited. The only settlement along this coast is a small one on the south shore of Telok Waoboe, 5 miles west-southwestward of Tanjong Maniburu.

In the area fronting this coast southward of the parallel of Tanjong Womosisoré and westward of the barrier reefs there are several detached shoals and drying reefs, but northward of that parallel there are no off-lying dangers inside the barrier reefs.

Noesir Islet, lying on the central part of a drying reef three-fourths of a mile long about 5 miles northwestward of Tanjong Maniburu, is high and well-wooded; it is a good landmark. Manimadjé and Nuragé are two islands connected by a drying reef and located in the bight northward of Tanjong Womosisoré at a distance of about 1 mile offshore. About 1 mile eastward of Nuragé is an elongated drying reef on which are three wooded rocky islets, Kikir, Rori, and Roenggabor, and several other rocky formations. In a valley on the northwestern shore of the inlet, west of the northern end of Nuragé Island, is Jauer Manokwari village, off which small craft with local knowledge can anchor. Close northeastward of Tanjong Jauer, situated 1½ miles northeastward of the northern end of Nuragé Island, is Noemanggoeri Island which is 269 feet high and is conspicuous from the northward.

10–376 Tanjong Manggoear is a high, rocky point at the northeastern extremity of the peninsula that forms the eastern side of Oemar Bay. A narrow reef on which there are several rocky islets extends northeastward for a distance of one-half of a mile from the point.

Oemar Bay is a roughly rectangular indentation in the coast southward of the point at the northern end of the peninsula, close westward of Tanjong Manggoear, and Tanjong Woibi *(2°54′S., 134°41′E.)*, situated 9¾ miles to the west-southwestward. The bay ranges in width from 8¼ miles at the northern end to 5¼ miles at its head, and it extends southward 6 miles from the line joining the entrance points. A 4¾-fathom shoal is situated nearly midway between the east and west shores 1¾ miles from the head of the bay; although there are several shoals and rocks close to the shores of the bay, this is the only detached off-lying shoal in the bay.

Rorenggi is a rocky islet close off the eastern entrance point of the bay. The east shore, southward of Rorenggi, is likewise rocky and is marked by two indentations, Nappan and Singgajebi Bays; it is closely backed by a mountainous ridge. The south shore of the bay is a steeply rising, sandy beach that is unbroken except at Tanjong Jarior, situated at the head of the bay, where there is a rocky section on which there is a conspicuous white patch that can be made out at a considerable distance. The west side of the bay to and including Tanjong Woibi, the western entrance point, is low and covered with mangroves; immediately southward of Tanjong Woibi is a small inlet named Nanggoe Bay.

The land around Oemar Bay is moderately well settled. On the west coast, just south of Nanggoe Bay, is the village of Nanggoebi; on the south shore of the bay are Jaratoer, Armini, which is easily identified by a small group of trees, Bawé, and Wakobi; and on the east shore of Oemar Bay, at the head of the small Nappan Bay, is the village of Nappan. Boats can land abreast Jaratoear village. Fresh fruit and vegetables are obtainable at the villages.

Anchorage can be taken anywhere in the bay close to the shore in 15 to 27 fathoms. Vessels entering the bay should steer in on course 180°, making directly for the white patch near Tanjong Jarior.

10–377 The coast between Tanjong Woibi and Tanjong Busurua *(2°29′ S., 134°38′ E.)* is steep, uninhabited, and lacking in anchorage places. It is clear of dangers northward of Goni village, situated 2 miles north-northwestward of Tanjong Woibi, but at a position 1¼ miles northward of that village there is a detached 2¾-fathom patch.

There is a 2¾-fathom shoal, which discolors, close northward of Tanjong Busurua. Westward of that point there is an open inlet named Joppingar Bay in which vessels can anchor in 25 to 30 fathoms. In the western part of the bay there are three detached reefs, and on the south and west shores of the bay are two villages.

From Tanjong Busurua to Tanjong Oransbari, 71 miles to the north-northwestward, the coast is high and is fronted by the larger islands of Roon, Mios Waar, and Roemberpon, and a number of smaller islands and reefs. Roon lies off the northern end of a peninsula which forms the large Wandammen Bay. A deep and clear channel will be found off this coast, leading eastward of Wairoendi and Mios Waar into Wandammen Bay, or eastward of those two islands and Roon and to the southern part of Geelvink Bay.

The peninsula on the eastern side of Wandammen Bay consists mainly of Wondiwoi Mountains, a range which attains an elevation of 7,346 feet. At the head of this bay is a low area with only a few elevated sections. Along the western side of the bay and the coast to the northward a range of hills and mountains lies a short distance inland. These mountains are of little importance as far as navigation is concerned, but the numerous points and islands are sufficient for that purpose. Southwestward of Tanjong Oransbari, however, where the land adjacent to the sea is low, are two hills, Sek Foer and Masimi, 1,535 and 656 feet in height, which will serve as landmarks.

10–378 Roon (Run) is a very irregularly shaped island, lying northwest of Tanjong Busurua and separated from the peninsula on the eastern side of Wandammen Bay by Numamuran (Noemanoeran) Strait, which is deep and clear. The island is hilly and rises to a height of 1,247 feet. Off its western side are a number of islands and several dangerous shoals and rocks. De Klerk Reef, the outer danger, lies 5⅓ miles west-northwestward of the northern end of the island and has a depth of 6 fathoms.

Anchorages.—The only anchorage on the east coast is in Menarboe Bay, in 30 fathoms. On the west coast there is anchorage at the head of Kajob Bay and at several places in the large bight on the northwestern side of the island. The bay at the village of War can only be entered by proas.

Rariei, Mansineer, and Rariau are high rocky islands on the northwest side of Roon; Noemberapi and Aoeri, two rocky formations, 115 and 75 feet in height, lying north and northeast of Rariau, constitute good landmarks.

Dangers.—A shoal, with a least depth of 2¾ fathoms, lies about 750 yards southwestward of the south end of Rariau. Shoals with depths of 4¼ and 3¼ fathoms, lie about 1¾ miles southwestward and 1 mile southward respectively, of the south extremity of Rariau. A shoal, with a depth of 3¼ fathoms, lies about 1½ miles southeastward of the same point.

10–379 **Jende Roads** (*2°22′ S., 134°32′ E.,* on the southern side of the large bight on the northwestern side of Roon, is best approached from the west by passing south of Rariei. A conspicuous church stands about ¼ mile westward of Jende. A vessel that is not too large can anchor in 25 fathoms between two projecting points of the shore reef. The roads are dangerous during squally weather, as the holding ground is not very good.

10–380 **Jende village**, abreast of the roads, consists of the houses of the natives built on poles in the water, and the dwellings of other people on the narrow sandy beach. In back of it the steep cliffs rise to a considerable height. Drinking water can be obtained from a waterfall.

10–381 **Mios Aoeri** northeast of Roon and east of Mios Waar, is separated from those islands by a deep and clear passage. The group consists of several islands and a number of shoals lying on a

bank of soundings with very irregular depths. The western edge of the bank is very steep-to and has practically a continuous shoal of 5 fathoms and less close within it. The three southernmost islands are low, but the other islands, farther to the northward, are steep and rocky. Maransabadi, the largest, is 410 feet in height. These islands are not inhabited, but are frequently visited by people from Roon.

There are several detached shoals with depths of less than 3¼ fathoms within 15 miles northeastward through southeastward of Maransabadi. A drying reef lies eastward of the southern end of the bank.

A string of reefs, some of which dry at low water, extends about 20 miles southeastward from the bank of soundings mentioned above. Among these reefs are two islets, Kuwom (Koewom) and Rorebo, 7 and 16 miles southeast of Matas, the southernmost island of Mios Aoeri. Both of these islets are low but well-wooded. The northern end of this string of reefs is a drying reef 2½ miles north of Kuwom; the southern end consists of three small drying patches 22 miles east of Tanjong Busurua. A deep channel separates these reefs from those near Kaboeai (sec. 10–370).

Tydeman Reefs, about 20 miles east of Iweri, the southeasternmost island of Mios Aoeri, is a string of reefs, 10 miles in length, lying in an area which is deep and clear with that exception. They consist of a number of drying and very shoal dangers. The westernmost group of the string has a least depth of 5 feet, and the northeastern danger is a drying reef.

10–382 Wandammen Bay lies west of the peninsula off the extremity of which Roon is located. Its western shore is steep but the eastern shore is bordered by a strip of low land which is thickly populated though little can be seen of the villages. The bay itself is comparatively clear and deep. Some shoals of 1 to 3¾ fathoms lie up to 3⅓ miles off the eastern side north of Tanjong Sobiei; near the shore are several drying reefs. A wide mud bank and some islets front the shore at the head of the bay. A reef, with a least depth of 1½ fathoms, lies on the western shore about midway in the bay. The rivers Wosimi and Ambboemi discharge here. About 2¼ miles from the head of the bay and nearly 1 mile from the western shore lies Aboewami, a small islet with reefs north and northwest of it. Five miles farther to the northward are two patches of one-half and 1 fathom. Oeresi is a drying rock near the western shore 4¼ miles still farther to the northward. A 9-foot shoal patch lies close offshore, about 1¼ miles south-southeastward of Oeresi.

In the entrance to the bay is the island of Jop with a drying reef extending nearly 2 miles to the northward; a 4¼ fathom shoal lies one-half of a mile farther to the northward. There is a deep and clear channel on each side of Jop, which rises at its northern end to a height of 476 feet.

10–383 Anchorages.—On the eastern side of the bay, at the northern end of the peninsula forming this side, are the two narrow bays of Raimoe and Van Dosterzee (Ainsendammen), which are deep and clear, and afford safe anchorage. There are no permanent settlements on the high shores which form these bays.

On the western side there is a safe anchorage west of Sombroko, an island 4 miles northwestward of Jop. One and 5 miles south of Sombroko are the two narrow but clear inlets, Telok Watiriraro and Telok Korio; their shores are uninhabited.

Other than the above, anchorage can be found most anywhere along the shores of the bay in depths of 30 to 33 fathoms.

10–384 Miei Roads *(2°44′S., 134°30′E.)*, lie in a bight of the eastern shore 12 miles southeastward of Jop. Suitable anchorage in depths of 16 fathoms, mud, will be found abreast the village. A light green spot on the

slopes of the mountains southeast of the village constitutes a good landmark.

An area from about 200 yards offshore, westward for about 2 miles, and northward and southward for about 3 miles, has a clear swept depth of 7 2/3 fathoms.

10–385 Miei village is the storage place for products of the district on the eastern side of Wandammen Bay. The coastal section is rich in sago palms, and nutmeg and bark is brought down from the higher sections. Fishing is carried on by the natives near the beach. A government official is stationed at Miei, and a government vessel makes regular call at the roads. The European houses and mission school are located on the hills beyond the village.

For the most part the tidal streams in the roads are negligible. There is a sandy beach, unobstructed by reef, in front of Miei and lighters are landed here.

A 560-foot stone pier is located at Wassior, a place about 1¾ miles northward of Miei, and there is a partically completed jetty nearby.

Good water can be obtained from a water line at Miei.

10–386 Windissi Roads, 11 miles northwestward of Jop, may be located by the high Tanjong Ronsore which lies southeast of it. Off the village of Windissi are a number of low but heavily-wooded islets, all surrounded by drying reefs in which navigable channels and inlets are found. Southeast of the southeastern islet there is suitable anchorage for large vessels in 25 fathoms. Smaller vessels can proceed into the inlet westward of this anchorage; here there are depths of 5½ to 6 fathoms. The edges of the reefs are not very well marked by discoloration. At the village is a small boat pier.

10–387 Coast. — Between Windissi and the southern end of Roemberpon only a few scattered habitations are found along the steep coast and there are no anchorages except that mentioned below. Along the southern part of this stretch of coast the reefs are well marked by discoloration, but farther northward, where the islets and reefs fronting it are more numerous discoloration can not be depended on to locate the reefs as the water is rather muddy.

Anchorage may be found off Kali Werror, close south of Mamisi village and 7½ miles north-northwestward of Windissi. At this place the rocky coast is broken by a sandy beach, one-third of a mile in length, which vessels can approach on a southwesterly bearing. Anchorage can be taken at most any depth and distance offshore, as the bottom rises gradually and consists of sand and mud. Large vessels can anchor in 19 to 22 fathoms. About 2½ miles southeastward of the roads is a reef with a least depth of 5 feet, which discolors well; about 3 miles northward of the roads is a 4-fathom shoal which is not marked by discoloration.

10–388 Mios Waar, northwest of Roon and about 12 miles off the northern part of this stretch of coast, is hilly and attains a height of 1,476 feet, but there are no conspicuous peaks, but a red patch on the southeast side 3 miles north-northeastward of Tanjong Riawepam is a good landmark. The northern coast is clear and along the eastern coast the dangers with 5 fathoms or less over them lie within three-fourths of a mile off the shore. Shoals of less than 4 fathoms extend 3 miles off the southern point. Off the western coast the dangers are more numerous and shoals of 2½ to 6 fathoms lie up to 6½ miles offshore. There is no safe anchorage near this island. The fairly large village of Wandoswaar lies on the northwestern side, the small village of Noesoemboni on the western side, and the large village of Jomber on the eastern side.

Wairoendi, 11 miles north of Mios Waar, is situated more toward the southeastern end of a narrow bank of soundings. It is a low, sandy, uninhabited island covered with tall trees; it constitutes an important landmark. Reefs and shoals of less than 5 fathoms extend up to 3⅓ miles northwestward from it.

Roemberpon (Rumberpon), northwestward of Mios Waar and close to the New Guinea coast, is hilly at its northern end and western side, but its eastern side is comparatively low and covered with mangroves. The 735-foot hill at the northern end of the island constitutes a good landmark, even at a great distance. The reefs near the island are not marked by discoloration. Anchorage may be found most anywhere near the drying coastal reef, even though the depths are great. Jali ali and Seneboeai villages on the east coast can be reached by channels through the drying reefs; Jembekiri and Jamakaan villages lie on the west coast.

10-389 ROEMBERPON STRAIT, which separates Roemberpon from New Guinea coast, has a large number of islets and dangers which greatly encumber its narrow southern end. There is a least depth of 2 3/4 fathoms in the fairway, the reefs are usually well marked by discoloration, and there is not much current. Vessels entering from the northward must take care to avoid the dangers in the northern part. The fairway then leads west of Noesero Ketjil and Noesero Besar. Abreast of Kasibi and Tanjong Pekiriwaisai favor the western shore, pass west and south of Apong, and then out at the southern entrance between Batoe and Masoon or between the latter and Tanjong Sassoi.

10-390 MAWI BAY AND SJERI ROADS (1° 39′ S., 134° 07′ E.).—Mawi Bay is located between Tanjong Sjeri and Tanjong Roenaki, the northern and southern entrance points, respectively. The 4,593-foot peak of the Mawi Mountains lies 3 miles westward of the bay. Tanjong Roenaki is formed by a sloping rock, off which a coastal reef extends some distance. Surf breaks on this reef much of the time. A detached 3 1/4-fathom shoal and a 6-foot detached shoal lie about 1/2 mile north-northeastward and close southeastward, respectively, of the coastal reef. A 10 1/4-fathom bank lies between the above-mentioned shoals. Sjeri Roads lies in the northern part of the bay westward of Tanjong Sjeri, and offers good anchorage in 27 to 44 fathoms. The roads are protected from the northerly swells that are encountered in Geelvink Bay. With easterly or southerly winds there is a shore sea in the roads. There is no current.

The most protected anchorage lies about 500 yards due south of Sjeri village in about 32 fathoms, mud and sand. Elsewhere the sea and swells will be felt sooner. The shore bank between Sjeri village and Tanjong Sjeri is steep and composed of sand, free of sontes. Boats and lighters can be landed on the beach here.

Westward of Sjeri village are two creeks in which small craft can find shelter. Local knowledge is necessary for entering over the bar.

Anchorage in the inlet northward of Tanjong Paresinai is not recommended because of the reef on the spit extending northeastward from that point.

TANJONG JORI, 7 miles northeastward of Tanjong Sjeri, is low and marked by high dead tree trunks. A bank of soundings, on which current rips are often seen, extends about 5 miles southeastward of it. On the bank are three shoals of 6 1/2, 5 1/4, and 2 1/2 fathoms. Vessels can pass close to the point, between it and the above shoals. A small military garrison is located at Momi village, 4 miles southwestward of the point. Here there is anchorage in 30 fathoms about 360 yards offshore abreast of a small wooden boat pier.

RAPAOWI, a village on the coast, is located about 2 1/2 miles northward of Tanjong Jori. A road connects Rapaowi and Ransiki, about 3 miles westward. A government official resides at Ransiki. There is a boat passage, about 250 yards wide, abreast of the village of Rapaowi, which is entered through the coastal reef. ANCHORAGE can be obtained in 4 to 8 fathoms, about 150 yards southeastward of the entrance of the boat passage. Depths of from 3 1/3 to 11 fathoms extend up to one mile from Rapaowi.

Batoe Haiwai is a drying reef 4 1/2 miles north-northeastward of Tanjong Jori. There is a deep and clear channel between it and the coast.

The coastal hills Masimi and Sek Foer have already been mentioned. (sec. 10-377).

TANJONG ORANSBARI is low but has a tall conspicuous tree on it. Extending eastward from the point is a bank of soundings on which are some shoal patches with as little as 2 3/4 fathoms over them. On the southern side of the point is an inlet where proas often wait for more favorable weather before continuing their journey northward; the currents which set across the shoals and around the point sometimes cause a difficult sea when the monsoon winds are strong. There are no anchorage facilities for larger vessels. On the northern side of the inlet is a small settlement. Vessels rounding the point should pass either close to it or at a considerable distance off to avoid the shoals.

10-391 COAST.—The coast between Tanjong Oransbari and Tanjong Saweba, a distance of 43 miles, is backed by high mountains, some of which extend very close to the shore. Of these mountains the Arfak Mountains, which rise to a height of 9,646 feet, are rather prominent. These high mountains are usually enveloped by clouds, which render them of little value to navigation. The coastal hills may be of some use as landmarks, however. In general, vessels can navigate close along this coast.

The coast for about 28 miles north-northwestward of Tanjong Oransbari is generally low but the hills come close to the shore in some places. About 5 miles northwestward of Tanjong Oransbari is Wantoki, a conspicuous grove of trees near the end of a range of hills. About 10, 14, and 22 miles northwestward of the point are conspicuous openings in the woods at War Moi, War Nasi, and War Moepi. The bottom along this coast is too steep for anchorage.

Near the mouth of War Andai, in the bight south of Dore Bay, there is anchorage in 19 to 30 fathoms. This little river has a wide mouth and can be navigated for a short distance by small craft.

10-392 TANJONG MEMORI is the northeast projection of the entrance to Dore Bay. It is a low, wooded point of a hilly peninsula with two rather vague summits; the western of these two summits is 755 feet in height and has a conspicuous tree on it.

LIGHT.—A light is shown from a white iron skeleton structure 52 feet in height, from the northeast extremity of Tanjong Memori.

A small detached 5-fathom shoal patch lies about 2 miles south-southeastward of Tanjong Memori light structure.

Southwest of Tanjong Memori, and forming the eastern side of Dore Bay is Mansinam Island, a hilly island with a height of 246 feet at its northern end. This latter elevation has a conspicuous tree on it.

Meteorological information, as recorded on Mansinam Island, is given in appendix II.

10-393 MENUKWARI(MANOKWARI) ROADS (0° 52′ S., 134° 05′ E.) lie in the inlet on the northern side of Dore Bay, and afford sheltered anchorage everywhere; there is an average depth of 16 fathoms. The reefs are hard to make out, but the east and north side of the Mansinam can be approached close to. Mios Wappi, westward of the northern end of Mansinam, is low and is covered with coconut trees on the north side and with mangroves on the south side.

PILOTAGE is compulsory in Menukwari Roads.

NAVIGATION AIDS.—Range lights are exhibited on request at Menukwari located about 1,200 yards north-northeastward of Tanjung Sanggen, the western entrance point of Menukwari Roads. These lights in range 006 1/2° lead into the inlet clear of the dangers lying in the entrance.

A light is shown from the northern end of the northernmost drying reef in the entrance.

Lighted buoys, marked in accordance with the uniform system, are in position to mark the reef extending southeastward from Tanjung Sanggen and the southwestern end of the northernmost drying reef in the entrance.

Mooring buoys are located in Menukwari Roads, about 1/4 and 1/2 mile, respectively, north-northwestward of the light at the entrance. Another mooring buoy is located close southwestward of the range lights.

Aviation mooring buoys are moored about 200 yards southeastward and about 400 yards westward, respectively, of Menukwari pier.

ANCHORAGE in sheltered locations, with depths of 16 to 21 fathoms can be taken in the roads. The bottom is not good, and a vessel may drag in strong gusts. In case of a prolonged stay or a crowded berth, vessels should moor head and stern.

DIRECTIONS.—Approach can be made day or night into the roads on a course of 290°, steering for the light on the northern side of the reef eastward of Tanjong Sanggen. When abreast the middle of Mios Wappi, the light should be brought to port and when the light is abeam, the shore lights of the town will come in sight. Anchor as convenient. If approach is made from the southward, steer on the range, 006 1/2°, passing between the buoys off Tanjung Sanggen.

10-394 MENUKWARI, a commercial port and settlement, is located along the shores of the inlet. It is the administrative capital of West New Guinea and has a population of about 11,500 (1961). The housing area consists of rows of houses on each side of a road extending along the shore. Menukwari is the site of a repair base.

BERTHAGE.—New Wharf, located on the west side of the harbor to the northward of the repair yard, is a T-head offshore wharf. The wharf is reported to be still under construction (1959). When completed the wharf will accommodate large vessels and will have full facilities.

Old Government Pier, located on the east side of the harbor, has a berthing length of about 230 feet with a depth alongside of about 14 feet.

The stone jetty at Menukwari is about 100 feet long. Small vessels can berth alongside. The remains of an old quay and a wreck are located off the jetty, making it impossible to anchor near it. It is reported that large vessels moor with their sterns to the jetty. Caution is necessary in order to avoid a 16-foot patch off the approach.

A jetty, completely overgrown with vegetation, is located on the north side of Saowi Bay.

A small tug, several lighters, and a mooring boat are available.

REPAIRS.—A newly completed ship building and repair yard is located on the west side of the bay. There is a transverse slipway with an access channel 180 feet wide and 24 1/2 feet deep. There are 26 cradles, each of 160-ton load capacity. The slipway is designed to handle ships up to 3,500 tons with a maximum length of 393 feet and a mean draft of 21 feet. There is a 50-ton boat gantry crane available at the repair yard. There is also a 12-ton crane. A fitting-out wharf in the channel to the repair yard has a length of 98 feet and a depth of 25 feet alongside.

SUPPLIES.—Water is piped onto the pier. Fresh provisions are scarce.

COMMUNICATION.—Vessels call at regular intervals. A radio station maintains communicatin with the general telegraph system. There is local telephone service. An airfield is located 2 miles southwestward of the town.

Medical.—There is a hospital with a capacity of 95 beds at the settlement.

10-395 COAST.—From Tanjong Memori the coast trends northwestward of 14 miles to Tanjong Saweba. It is high and steep-to and vessels can proceed at a short distance offshore. Only sailing proas and light-draft vessels will find anchorage back of Meos Auri, a small islet east of Tanjong Saweba. An islet, about 55 yards in diameter, lies about 1,000 yards 308° from the northern tip of Meos Auri. The islet stands on a drying reef which is about 110 yards in diameter. Some dangers are charted off the southern end of and near the coast northwestward of Meos Auri.

Tanjong Saweba, which can be approached within a short distance, is low but is backed by hills of about 1,000 feet elevation. The small Meos Auri, about 3 miles to the southeastward of the point, is covered with high trees and can be easily recognized.

A bank, with a depth of 40 fathoms, exists about 34 miles northeastward of Tanjong Saweba.

10-396 MAPIA (ST. DAVID) ISLANDS (0° 49′ N., 134° 17′ E.), about 95 miles northnortheastward of Tanjong Saweba, consist of three islands, Pegun, Bras and Fanildo, which are situated on the edge of an oval atoll, 9 miles in length, north and south. The islands are low and have a number of high coconut trees on them which can be seen from a considerable distance.

Fanildo is 32 feet high, Bras 40 feet, and Pegun 54 feet high at its south end.

When approaching the islands, especially from the northeastward, great caution should be exercised. This is especially true when approaching against a low sun or with smooth water, as the edges of the atoll cannot be seen except at low water springs. The use of the lead is out of the question as the atoll is steep-to.

There is usually a surf over the reef, but it does not mark the outer edges, as it is, on the whole, inside them.

The edges of the reef dry at low-water springs.

The lagoon within the atoll is filled with rocks. It is possible for a boat to enter through a narrow winding channel on the west side, more than 2 miles north-northwestward of the northern end of Pegun.

The settlement on the southern part of Pegun is the headquarters of an American agricultural concession.

10–397 Anchorage.—In general there are no satisfactory anchorages, but small vessels can find temporary anchorage during good weather off the northern side of the atoll.

The usual landing place is near the settlement on the southern part of Pegun. Landing is accomplished at high tide but during inclement weather, or with high rollers, it is very dangerous, if not impossible.

Winds and weather.—See section 1–40.

During the survey, from the middle of June to the middle of August in 1918, it was observed that the winds were principally from east and east-southeast. They were often of considerable force, were accompanied by much rain, and made landing difficult, or impossible, because of the high surf and the rollers.

Tides.—The tides at these islands are the same as those at the Ajoe Islands (sec. 6–4).

Current.—During the survey of 1918 a 1½-knot current, setting westward, was observed at Pegun Island and during another survey in 1933 a current of the same strength was observed to be setting constantly in a west by north direction.

Coast.—Between Tanjong Saweba and Tanjong Boropen, 22½ miles to the westward, the coast is very sparsely inhabited. The principal settlements along this stretch of coast are Befoor, Warikau (which is conspicuous), Maseni, and Sidai.

Kleine Geelvink Bay, 13 miles west of Tanjong Saweba and south of Tanjong Wilbain (Wilbaim) is much frequented by proas but cannot be used by larger vessels as the shore is steep.

10–398 Tanjong Boropen (*0°43′ S., 133°34′ E., H. O. Chart 2933 and Neth. Chart 365*).—West of Sidai, between the point of the same name and Tanjong Boropen, there is a very small proa harbor with a depth of 8 fathoms. Suitable anchorage for large vessels can be found west of Tanjong Boropen.

10–399 Coast.—From Tanjong Boropen the coast trends west for 11 miles and then northwest for 12 miles to Tanjong Manganeki. The settlements along this coast are Kaironi, south of Tanjong Boropen, and Moebrani in the angle of the coast line.

Under favorable weather conditions vessels can find anchorage in certain places along this coast.

Several shallow depths lie in the vicinity of the 10-fathom curve.

Byenkorf Mountain, 1,362 feet in height, standing 3½ miles south-southwestward of Tanjong Boropen is conspicuous.

This mountain seen open of the fairly sharp 890-foot peak, one of the three distinct elevations in the ridge in back of the coast, leads clear of the shallow patches between Moebrani and Tanjong Manganeki.

To keep outside the shallow patches between Tanjong Boropen and Moebrani, keep the 492-foot summit of Tanjong Wibain open of Tanjong Boropen.

At about 4 miles westward of Moebrani there is a conspicuous double top, 1,410 feet high, with a conspicuous tree on its western side, and about 4½ to 5½ miles farther northwestward there are three conspicuous peaks with heights of 2,230, 2,475, and 2,410 feet, respectively.

10–400 Tanjong Manganeki may be recognized by the 690-foot hill close in back

of it. From Tanjong Manganeki the shore trends westward, with several indentations, for 19 miles to Tanjong Saoekris. There are several settlements on this shore and between those of Saoekorem and Warpaperi and about 6½ miles northwestward of Tanjong Manganeki, there is a projecting reef through which there is a channel that enables boats to land regardless of the surf.

A conspicuous flat-topped hill, 1,640 feet high, stands 3½ miles westward of Tanjong Manganeki and is visible for a considerable distance from eastward.

Tanjong Srabapan, 3 miles west-northwestward of Warpaperi settlement, is low with high trees on it.

10–401 **Boltop,** a conspicuous round-topped peak, 3,050 feet high, stands 4 miles west-southwestward of Tanjong Srabapan.

Piekje, a 2,135-foot elevation, standing 2½ miles southwestward of Tanjong Saoekris, is very conspicuous from the eastward.

From Tanjong Saoekris the coast trends west-northwestward for 15 miles to Cape Valsche (Tanjong Weios). There are steep rocky sections along this coast, interrupted by low, flat places.

At 4 miles west of Tanjong Saoekris there is a point on which the settlement of Wau stands. A 19½-foot patch lies eastward of the point and a 16½-foot patch lies southeastward of the above. Anchorage can be found in 7½ fathoms inside these patches.

From Cape Valsche the shore trends westward for 18 miles to Cape of Good Hope. There is good temporary anchorage almost everywhere along this coast and in favorable weather vessels can even anchor between the 5- and 10-fathom curves.

The 968-foot hill, which stands about 6 miles eastward of the Cape of Good Hope, has a conspicuous round top and drops sharply toward the sea.

On the east side of the foot of Cape Valsche there is a chimney-shaped rock.

Tanjong Kambrini, 6½ miles westward of Cape Valsche, is a rocky formation, 165 feet high, and is at the end of a chain of hills.

Warmandi settlement, 2 miles eastward of Tanjong Kambrini, is west of a 425-foot hill which drops sharply to the sea.

APPENDIX I

List of principal ports, showing particulars of depths

Port	Depth in approach	Depth at anchorage	Depth at pier
	Fathoms	*Fathoms*	*Feet*
Ambon Roads, Ambon Island	Deep	25	15–28
Banda (Neira) Roads, Banda Islands	Deep	5 or over	15–26
Boela Bay, Ceram Island	Deep	18 and less	27
Fak Fak, Netherland New Guinea	Deep	24	12
Hollandia, Netherlands New Guinea	Deep	20–24	20–30
Kajeli Roads, Boeroe Island	Deep	19–22	6
Madang Harbor	Deep	6–12	8–25
Port Moresby, Territory of Papua	6½	6–8	8–27
Samarai	Deep	6	10–23½
Sorong-Doom, Netherlands New Guinea	Deep	11–14	25–40
Ternate Roads, Ternate Island	19	15	14

APPENDIX II.—METEOROLOGICAL TABLES

[U. S. Weather Bureau, Department of Agriculture]

STATION—MENADO.—*Position, latitude 1°30′ N.; longitude 124°50′ E. Altitude, 30 feet*

Month	Air temperature, (°F.)			Relative humidity (percent)		Rain			Wind [1]											Average number days with thunder storms	Mean percent sunshine	Cloud amount. Scale, 0 to 10. Mean daily observations: 7h, 14h, 17h
											Percentage of observations from—											
	Mean	Mean maximum	Mean minimum	6 a. m.	Noon	Average fall (inches)	Number of rainy days	Maximum fall in 24 hours (inches)	Mean velocity (knots)	Dominant direction	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm			
January	78	84	73	94	76	18.31	21	9.61	7.2	W.										3.3	52	3.8
February	78	84	73	93	74	14.06	18	5.63	7.9	W.										5.0	57	3.3
March	78	85	72	94	72	12.01	16	7.44	5.8	NW.										1.3	58	4.2
April	79	86	73	94	73	7.80	13	4.13	6.0	W.										4.3	68	4.4
May	79	86	75	93	71	6.30	13	6.38	4.9	E.										4.7	68	2.6
June	79	86	73	91	68	6.42	12	5.43	5.4	E.										2.0	66	3.2
July	80	88	73	85	61	4.68	9	8.43	6.0	ESE.										2.3	73	2.8
August	80	89	73	85	57	3.82	9	8.15	6.4	ESE.										2.8	76	1.9
September	80	89	72	87	59	3.43	8	4.02	6.4	ESE.										2.3	74	2.1
October	80	88	73	91	63	4.80	10	3.31	6.0	E.										3.5	72	1.8
November	79	87	73	94	70	8.62	14	5.59	6.0	W.										3.8	65	3.6
December	79	86	74	95	74	14.57	19	8.07	6.4	W.										1.7	59	3.0
Means	79	87	73	91	68				6.3												66	3.0
Total						104.82	162													35.0		
Extremes								9.61														
Number of years' observations	15	9	9	9	9	50	50	41	2	2										4	11	3

[1] Observations every hour between 8 a. m. and 11 p. m.

STATION—AMBON.—*Position, latitude, 3°42′ S.; longitude, 128°10′ E. Altitude, 14 feet*

Month	Air temperature (°F.)			Relative humidity, (percent)		Rain			Wind											Average number of days with thunderstorms	Mean percent sunshine	Cloud amount. Scale, 0 to 10 Mean daily observations; at 7h, 12h, 17h.
										Percentage of observations from—												
	Mean	Mean maximum	Mean minimum	6 a. m.	Noon	Average fall (inches)	Number of rainy days	Maximum fall in 24 hours (inches)	Mean velocity (knots)	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm				
January	81	87	76	92	69	5.00	13	4.49		13	16	7	3	3	7	13	19	19	6.7	61	3.0
February	80	88	75	90	66	4.68	12	3.46		18	18	4	3	6	7	25	25	0	6.0	59	2.7
March	80	88	75	91	66	5.32	15	3.86		7	16	3	6	3	10	16	29	10	7.0	66	2.4
April	79	86	75	93	73	11.02	18	9.49		10	10	13	17	7	10	13	7	13	6.0	56	3.7
May	79	84	75	92	74	20.32	22	9.76		3	10	36	23	3	3	6	3	13	2.3	51	3.5
June	77	82	74	90	77	25.08	24	9.80		0	17	27	13	0	13	3	3	24	2.5	39	5.3
July	77	81	73	91	76	23.66	23	11.81		0	16	39	26	3	0	3	3	10	1.8	37	4.8
August	77	82	73	91	73	15.83	20	9.84		3	13	26	45	3	0	3	3	7	2.3	36	3.1
September	78	84	73	92	71	9.53	15	8.86		0	3	20	57	7	3	0	0	10	3.0	48	2.5
October	79	86	74	93	68	6.06	13	7.28		3	0	19	45	7	6	7	0	13	4.0	61	2.2
November	80	87	74	93	67	4.49	11	3.94		0	0	17	33	7	13	7	10	13	8.8	69	2.0
December	80	88	75	92	66	5.16	13	4.61		10	6	7	13	3	19	13	10	19	6.5	63	2.1
Means	79	85	74	92	70					6	10	18	24	4	8	9	9	12		54	3.1
Total						136.15	199												56.9		
Extremes								11.81													
Number of years' observations	15	9	9	9	9	50	50	41		5									4	11	4

STATION—MEATIJ MIARANG.—*Position, latitude 8°22′ S.; longitude 128°30′ E. Altitude, 92 feet*

Month	Air temperature (°F.)			Relative humidity (percent)	Rain			Wind										Cloud amount. Scale, 0 to 10
									Percentage of observations from—									
	Mean	Mean maximum	Mean minimum		Average fall (inches)	Number of rainy days	Maximum fall in 24 hours (inches)	Mean velocity (knots)	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	
January								13.9	4	1	(1)	2	4	13	29	46		
February								13.9	3	1	1	3	5	13	27	47		
March								10.5	4	2	7	9	7	12	24	35		
April								11.5	2	4	27	46	13	4	1	1		
May								14.2	(1)	2	29	56	11	2	(1)	(1)		
June								14.8	.....	(1)	28	68	6	.....	.....	.....		
July								14.0	.....	(1)	27	67	6	.....	.....	.....		
August								13.2	.....	(1)	31	63	6	(1)	.....	.....		
September								11.3	.....	(1)	28	60	11	2	(1)	.....		
October								9.1	1	3	23	51	16	6	(1)	(1)		
November								7.0	4	5	19	37	17	8	5	5		
December								8.7	7	2	7	9	9	15	25	27		
Means																		
Total								11.8	2	2	19	39	9	0	9	17		
Extremes																		
Number of years' observations								11	11									

[1] Less than 0.5 percent.

STATION—PORT MORESBY.—*Position, latitude 9°29′ S.; longitude 147°9′ E. Altitude, 126 feet*

[Observations taken at 9 a. m.]

Month	Air temperature (° F.)			Relative humidity (percent)	Rain			Wind										Cloud amount. Scale, 0 to 10
									Percentage of observations from—									
	Mean	Mean maximum	Mean minimum		Average fall (inches)	Number of rainy days	Maximum fall in 24 hours (inches)	Mean Velocity (knots)	North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	
January	82	89	76	71	7.20	15	3.5	9.6	5	.....	.....	11	.....	.....	10	60	14	
February	82	88	76	73	8.28	14	3.5	5.4	4	.....	1	2	.....	.....	4	78	11	
March	82	88	76	74	6.94	15	6.3	11.0	9	.....	1	11	1	.....	13	49	16	
April	82	87	76	75	4.09	9	1.3	7.2	.....	.....	2	38	.....	2	7	33	18	
May	80	85	76	76	2.67	6	1.8	7.8	2	.....	2	56	.....	1	8	14	17	
June	79	84	75	77	1.23	5	.6	8.1	1	.....	.....	71	.....	.....	1	6	21	
July	78	82	74	77	1.14	4	3.6	11.4	.....	.....	.....	75	1	.....	.....	2	23	
August	78	82	73	77	.72	4	.7	10.4	.....	.....	.....	89	.....	.....	.....	.....	11	
September	78	83	74	76	1.16	6	4.2	7.1	.....	.....	1	75	.....	.....	.....	2	22	
October	80	86	75	75	1.27	5	2.0	8.9	.....	.....	1	80	.....	.....	.....	1	18	
November	81	87	76	71	1.83	6	1.9	8.0	3	.....	2	64	.....	.....	1	4	26	
December	83	89	76	70	3.96	9	3.7	5.8	8	2	2	27	1	.....	6	27	27	
Means	80	86	75	74														
Total					40.49	98	.....	8.4	3	(1)	1	50	(1)	(1)	4	23	19	
Extremes							6.3											
Number of years' observations	32	28	28	28	38	34	6	3	3									

[1] Less than 0.5 percent.

STATION—MANSINAM.—*Position, latitude 0°54′ S.; longitude 134°05′ E.*

Month	Air temperature °F.			Relative humidity (percent)	Rain			Wind										Cloud amount Scale 0 to 10
	Mean	Mean maximum	Mean minimum		Average fall (inches)	Number of rainy days	Maximum fall in 24 hours (inches)	Mean velocity (knots)	Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	
January					11.65	13					6			32	39	32		
February					9.37	12				4	4			19	19	54		
March					10.31	13				29	11			14	21	25		
April					10.00	12			5	11	24	3		8	40	11		
May					5.94	10			3	9	53	6	6	3	6	12	3	
June					7.24	10				6	68			3	16	3		
July					5.00	8				16	42	3		6	21	6	3	
August					6.65	9				11	39	11		11	29			
September					4.09	7				13	23			17	33	10	3	
October					4.57	8				15	29	10		17	24	2	2	
November					5.79	9			11	23	6	3		20	9	29		
December					9.21	12				4	7			11	36	36	7	
Means									2	12	27	3	1	14	24	17	2	
Total					89.82	123												
Extremes							7.91											
Number of years' observations					18				1									

OCEAN AREA.—*Latitude 0° to 5° N.; longitude 130 to 135° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind									Weather									Cloud amount. Scale 0 to 10. Mean daily.
		Mean velocity (knots)	Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Percentage of observations recording— Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	
January	68	6	28	17	3			3	6	26	14	1	3			6	9	1			7	3.9
February	26	6	27	15	4			12	12	31		4				4	27					3.6
March	37	7	16	28	3	3	3	3	14	16	11		5			3	3				3	4.5
April	28	9	18	25		4	8	15	18	7	7		4		4	11		7			4	3.8
May	13	9	20		20			10	30	10	10					8	15				15	5.7
June	9	7			22		33	11	22		11		11				11	11				2.4
July	25	6	6	6		6	47	18	12	6					4	4	4	36				5.8
August	27	12		8	4	8	23	43	12		12						4	15			4	4.3
September	17	8			6	6	44	18	12			6				12		6			6	4.0
October	20	9	12	6	6	18	6	6	36		12					5	5					2.8
November	35	7	18	9	3	3	3	17	25	15	9					3	6	11			9	4.5
December	85	8	35	14	5		4	5	11	19	5	1	1	1	1	12	7	7	2			4.3
Mean		8	15	11	6	4	14	13	18	11	8	1	2	(1)	1	6	8	8	(1)		4	4.1
Total	390																					
Extreme values																						

[1] 0.5 percent or less.

OCEAN AREA.—*Latitude 0° to 5° N.; longitude 125° to 130° E. Years covered: About 1880–1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentage of observations recording— Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Upper	Scale, 0 to 10. Mean daily: Cloud amount
January	44	6	35	28	4	.....	4	.....	2	13	12	5	.....	.....	.....	2	5	14	.....	.....	7	.....	4.4
February	38	7	28	30	3	3	3	.....	11	22	3	5	.....	.....	.....	11	8	8	.....	.....	8	.....	4.7
March	46	6	28	42	6	.....	6	4	.....	6	6	2	.....	.....	.....	6	2	10	.....	.....	10	.....	4.3
April	27	7	30	19	8	11	.....	4	11	15	4	.....	.....	.....	.....	7	7	11	.....	.....	7	.....	3.7
May	42	6	.....	14	20	14	12	11	6	8	17	.....	.....	.....	2	4	12	28	.....	.....	7	.....	4.3
June	39	5	3	8	13	29	18	16	6	5	3	.....	.....	.....	5	13	18	10	.....	.....	5	.....	5.6
July	40	7	.....	3	8	21	45	8	11	3	3	.....	.....	.....	.....	20	8	8	.....	.....	5	.....	5.5
August	47	12	.....	2	.....	27	40	24	7	.....	.....	4	2	.....	9	6	2	6	.....	.....	13	.....	5.5
September	38	9	.....	3	.....	.....	31	36	14	8	8	5	.....	.....	.....	8	6	8	.....	.....	3	.....	4.7
October	36	7	3	12	3	16	22	18	9	3	9	.....	.....	.....	.....	6	6	8	.....	.....	3	.....	4.2
November	50	6	8	.....	4	6	10	24	30	8	12	8	.....	.....	2	2	8	20	.....	.....	2	.....	4.8
December	49	7	29	13	4	2	4	6	11	27	2	.....	.....	.....	2	10	2	6	.....	.....	2	.....	4.5
Means	.....	7	14	14	6	11	16	13	10	10	6	2	(1)	.....	2	8	7	11	.....	.....	6	.....	4.7
Total	498	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Extreme values	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Less than 0.5 percent.

OCEAN AREA.—*Latitude 0° to 5° S., longitude 125° to 130° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentage of observations recording Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Scale, 0 to 10. Mean daily: Cloud amount.
January	97	6	28	7	2	2	2	4	17	24	15	4	2	.....	1	10	7	9	.....	.....	5	5.0
February	82	6	19	12	2	3	4	7	12	35	7	3	.....	.....	.....	2	11	13	.....	.....	5	5.2
March	57	7	25	11	4	4	.....	13	16	25	5	2	.....	1	.....	5	2	4	.....	.....	.....	5.6
April	47	6	2	7	2	14	5	15	15	24	15	.....	2	.....	.....	4	9	4	.....	.....	2	5.1
May	39	6	3	5	11	52	3	8	3	3	13	.....	.....	.....	.....	11	8	3	.....	.....	.....	5.4
June	29	7	4	7	11	37	18	8	4	11	.....	3	.....	.....	.....	3	3	10	.....	.....	.....	5.4
July	55	9	4	8	9	44	25	4	6	2	.....	2	.....	.....	4	11	25	4	4	.....	.....	6.1
August	51	10	2	.....	10	69	13	2	2	.....	2	2	2	.....	2	2	4	.....	.....	.....	2	3.4
September	33	7	.....	.....	18	47	12	9	6	3	3	3	3	3	3	6	6	.....	.....	.....	3	4.2
October	20	8	5	.....	16	32	32	5	.....	5	5	15	.....	.....	.....	.....	5	5	.....	.....	.....	4.9
November	42	5	16	5	6	17	22	6	13	6	8	2	.....	.....	.....	.....	2	10	.....	.....	.....	4.1
December	116	6	18	8	2	8	8	7	14	30	8	.....	.....	.....	.....	10	7	20	.....	.....	3	4.8
Means	.....	7	10	6	9	27	12	8	9	14	7	3	1	1	1	5	7	7	(1)	.....	2	4.9
Total	648	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Extreme values	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Less than 0.5 percent.

OCEAN AREA.—*Latitude 5° to 10° S., longitude 125° to 130° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentage of observations recording Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Scale daily Cloud amount. 0 to 10. Mean
January	30	11	7			3	3	13	53	20		3				10	7	33		4		12	6.0
February	25	9			8	4	8	21	42	12	4					20			4			12	5.9
March	33	7	6		3	6		16	35	23	10	3				6	3					3	4.8
April	18	9	8	8	23	38		8	8		8	11	6			6	6	6					4.9
May	29	9		8	14	40	4	8	19		7	7	3			3	3	3					4.7
June	11	10		9	18	73						18										18	2.9
July	24	11			36	56	8					8										4	3.6
August	37	11		6	40	49	3	3				5					3					16	2.9
September	27	8		13	13	43	13	4		8	4	19						4				7	3.6
October	17	7		6	6	47	18		6		18	12										6	3.7
November	40	5	11	10	19	11	11	16	8	5	11						5	12					3.4
December	53	7	14	4		6	4	10	33	19	12				2	10	6	15	2			4	1.0
Means		9	4	5	15	31	6	8	17	7	6	7	1		(1)	5	3	6	1			0	3.9
Total	344																						
Extreme values																							

[1] Less than 0.5 percent.

OCEAN AREA.—*Latitude 5° to 10° S.; longitude 130° to 140° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentages of observations recording Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Scale Mean cloud amount. 0 to 10
January	27	9	7	7	7				44	22	11	4				4		7			4	6.0
February	43	8	2	5	5	2	8	5	30	35	8					19	5	2			19	5.8
March	41	6	3	3	11	16	5	24	24	11	5	2					2				5	4.9
April	34	7	9	11	20	17	3	11	14	9	6	3				3	6	14			11	4.5
May	36	9	6	3	47	33	3	3	3		3					8	17	8			3	4.5
June	39	12	3	3	26	57	3					3					13				8	4.2
July	35	12			37	51	9		3			6				9	14				6	4.4
August	48	12		2	29	60		4	4								2				25	3.6
September	33	8		6	31	53	3			3	3	9					3				15	2.5
October	24	9			35	26	17	9	4		9		4			4						3.2
November	35	7		9	52	24		3		3	9	11	3					6				2.0
December	31	7	10		6	3	6	16	45		13						3	6			10	3.4
Means		9	3	4	26	29	5	6	14	7	5	3	1			4	5	4			9	4.1
Total	428																					

OCEAN AREA.—*Latitude 5° to 10° S.; longitude 150° to 155° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentages of observations recording Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Scale: Mean cloud amount. 0 to 10
January	14	6	8	8	8	8	31	.....	16	23	.....	7	.....	.....	.....	7	.....	7	.....	.....	.....	5.0
February	21	7	5	10	16	.....	11	5	16	32	5	.....	.....	.....	.....	10	14	14	.....	.....	.....	5.8
March	30	8	14	13	3	17	6	7	10	17	10	3	.....	.....	.....	.....	13	17	.....	.....	3	4.9
April	23	5	10	14	15	24	10	5	5	15	5	.....	.....	.....	.....	9	.....	4	.....	.....	9	4.1
May	40	8	3	.....	30	33	15	.....	3	.....	15	.....	.....	.....	2	4	8	18	.....	.....	5	5.0
June	30	12	.....	10	27	33	13	3	.....	.....	13	3	.....	.....	.....	13	13	13	.....	.....	3	5.0
July	22	13	.....	10	14	59	14	.....	5	.....	.....	.....	5	.....	.....	10	5	5	.....	.....	.....	5.3
August	32	14	.....	6	19	63	6	3	.....	3	.....	.....	.....	.....	.....	12	16	3	.....	.....	3	5.7
September	27	9	4	.....	11	52	15	4	7	.....	7	.....	.....	.....	.....	11	11	19	.....	.....	.....	4.8
October	29	10	11	.....	8	53	15	4	4	.....	7	.....	.....	.....	.....	3	.....	.....	.....	.....	7	4.9
November	29	9	8	16	8	33	25	.....	.....	8	.....	4	.....	.....	.....	15	11	.....	.....	.....	4	5.6
December	24	6	.....	23	9	19	10	5	9	18	9	.....	.....	.....	.....	.....	17	4	.....	.....	4	4.0
Means	.....	9	5	9	14	33	14	3	6	10	6	1	(1)	.....	(1)	8	9	9	.....	.....	3	5.0
Total	321	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] 0.5 percent or less.

OCEAN AREA.—*Latitude 10° to 15° S.; longitude 150° to 155° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind: Mean velocity (knots)	Wind: Percentage of observations from— North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Weather: Percentages of observations recording Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	Scale: Mean cloud amount. 0 to 10
January	16	11	.....	20	33	7	14	.....	20	7	.....	6	.....	.....	.....	.....	12	.....	.....	.....	.....	3.8
February	22	10	.....	5	40	25	.....	5	15	10	.....	5	.....	.....	.....	23	5	9	.....	.....	9	5.8
March	35	8	8	17	8	29	4	4	13	4	13	.....	.....	.....	.....	12	8	4	.....	.....	8	4.6
April	32	9	10	6	20	55	10	.....	.....	.....	.....	9	.....	.....	.....	27	5	.....	.....	.....	9	5.4
May	37	12	.....	7	30	60	4	.....	.....	.....	.....	.....	.....	.....	.....	4	7	.....	4	.....	.....	5.6
June	29	13	.....	7	28	55	7	.....	.....	.....	3	.....	.....	.....	.....	3	7	3	.....	.....	.....	4.9
July	26	12	.....	.....	32	60	8	.....	.....	.....	.....	.....	4	.....	.....	4	12	.....	.....	.....	.....	4.9
August	24	15	.....	.....	29	66	.....	4	.....	.....	.....	.....	.....	.....	.....	4	17	.....	4	.....	12	5.3
September	25	14	.....	4	40	48	.....	4	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	4.0
October	21	16	.....	.....	52	43	5	.....	.....	.....	.....	5	.....	.....	.....	5	.....	.....	.....	.....	19	5.4
November	23	11	.....	10	33	39	5	5	5	.....	5	.....	.....	.....	.....	13	4	.....	.....	.....	9	4.4
December	17	9	7	33	27	13	13	.....	.....	.....	7	6	.....	.....	.....	12	.....	6	.....	.....	6	5.1
Means	.....	12	2	9	31	41	6	2	4	2	3	3	.....	.....	.....	9	6	2	1	.....	6	4.9
Total	277	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

OCEAN AREA.—*Latitude 0° to 5° S.; longitude 140° to 160° E. Years covered: About 1880 to 1931*

[Greenwich noon observations]

Month	Number of observations surveyed	Wind										Weather										Scale
		Mean velocity (knots)	Percentage of observations from—									Percentages of observations recording										Mean cloud amount, 0 to 10
			North	Northeast	East	Southeast	South	Southwest	West	Northwest	Calm	Haze	Mist	Fog	Drizzle	Rain	Showers	Thunderstorms	Heavy squalls	Gales (force 9 or over)	Exceptional visibility	
January	16	12	7	.....	13	13	.....	.....	27	40	.....	.....	.....	.....	.....	.....	13	6	.....	.....	6	4.4
February	18	8	7	.....	.....	.....	13	7	47	20	7	.....	.....	.....	6	17	.....	.....	.....	.....	.....	5.6
March	21	8	.....	.....	10	10	.....	.....	20	60	.....	.....	.....	.....	.....	5	10	.....	.....	.....	38	7.1
April	25	7	13	4	4	13	4	.....	25	33	4	4	.....	.....	.....	8	.....	24	.....	.....	.....	4.6
May	36	7	12	18	32	14	3	6	.....	9	6	.....	.....	.....	.....	6	8	8	.....	.....	6	3.9
June	21	5	.....	15	35	26	4	4	.....	4	4	.....	.....	.....	.....	4	9	13	.....	.....	4	3.7
July	31	7	7	7	14	21	24	7	7	7	7	.....	.....	3	.....	13	10	.....	.....	.....	.....	6.2
August	36	9	3	16	29	26	13	6	.....	3	3	3	.....	.....	.....	3	8	17	.....	.....	14	4.1
September	24	6	4	4	30	30	9	9	4	4	4	.....	.....	.....	.....	13	.....	13	.....	.....	.....	4.5
October	40	7	20	17	9	23	6	6	9	6	6	.....	.....	2	.....	2	10	2	.....	.....	12	4.6
November	28	10	4	11	4	14	4	7	21	32	4	7	.....	.....	.....	7	.....	14	.....	.....	4	5.7
December	17	10	6	13	6	6	.....	.....	13	50	6	.....	.....	.....	.....	6	6	.....	.....	.....	12	5.4
Means	.....	8	7	9	16	16	7	4	14	22	4	1	.....	(1)	1	7	6	8	.....	.....	8	5.0
Total	315	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Less than 0.5 percent.