

ture. The pyramid is difficult to recognize, however, because of a white building behind it.

Good ANCHORAGE can be taken during the Southeast Monsoon in $6\frac{1}{2}$ fathoms, mud and sand, about 770 yards offshore with the light structure or pyramid bearing 125° and the rocky plateau southwest of Seba bearing 185° . A drying reef lies $\frac{1}{4}$ mile northwest of the light structure. During the west monsoon vessels anchor about 1,400 yards offshore in 19 fathoms.

Fresh meat and fruit are available in limited quantities. Vessels call regularly at Seba.

A LIGHT is shown at Seba on request only.

PULAU RAIDJUA, separated from Pulau Sawu by Selat Raidjua, is inhabited and cultivated. The rajah of the island resides near Namo, a village on the north coast of the island west of Tandjung Beh. During the Southeast Monsoon ANCHORAGE can be taken off Namo in 20 fathoms, sand, about 550 yards offshore with a 253-foot hill south of the village and a white sandy path running inland from the beach, in line bearing 194° .

DANA, an uninhabited island, is low and covered with scrub. A conspicuous bare rock, 112 feet high, is located on the north coast of the island. ANCHORAGE can be taken in 16 fathoms, sand, north of the 112-foot rock, with the extremities of the island bearing 144° and 206° . There is a sandy beach on the northeast coast.

PULAU ROTI

7B-7 PULAU ROTI is surrounded by a coastal reef which is fairly broad in places; outside this reef the depths generally increase rapidly, and in some places off the south coast the 100-fathom curve is only $\frac{1}{2}$ mile from the shore. There are a few detached dangers, and the only ones at any distance from the coast are Beatrice Reefs, at the southeast entrance of Selat Roti.

A CURRENT of 3 knots sometimes runs in the passages between the islands off the west coast of Pulau Roti.

ISLANDS AND DANGERS OFF THE WEST COAST OF PULAU ROTI.—Pulau Dana, close south of Tandjung Bua, the southwest extremity of Pulau Roti, is a rocky island about 157 feet high. South of the island there is a heavy swell and a turbulent sea all the time. Pulau Halihana, close northeast of Pulau Dana, is a steep, rocky island, 348 feet high. A 6-fathom shoal lies about $4\frac{1}{2}$ miles southwest of the south extremity of Pulau Dana; shoal water was reported (1954) to lie about $1\frac{1}{3}$ miles west of the above 6-fathom patch.

Pulau Ndao, Pulau Nuse, and Doo all lie inside the 100-fathom curve off the west coast of Pulau Roti; if passing between these islands from southward, it is advisable to pass east of Doo and thence between Pulau Ndao and Pulau Nuse. There is also a passage between Pulau Nuse and Pulau Roti, but it is very narrow because of the coastal reef extending from Tandjung Tongga. A coral bank, on which a least depth of 6 fathoms was found after a very careful examination, lies 2 miles north of the east point of Pulau Nuse; according to one pearl fisher, however, there is a small patch of $2\frac{3}{4}$ fathoms here.

There is good ANCHORAGE south of Pulau Nuse in 8 to 11 fathoms, sand and coral.

SOUTH COAST OF PULAU ROTI.—TELUK BUKA, entered between Tandjung Makar and a point about 6 miles east-northeast, is fringed on its north and west sides by a broad bank of sand and coral. A white stone PYRAMID, conspicuous from seaward, stands on Tua, a small islet on the coastal reef about $3\frac{1}{4}$ miles north-northeast of Tandjung Makar.

Pulau Landu, 341 feet high at its west end, lies close off the south entrance of Teluk Buka and is separated from the Roti coast by an unimportant strait. Nusa Manuk, 167 feet high, lies on a drying reef connected to Tandjung

(6991) **PERSIAN GULF—Jazireh-e-Khark—Oil Terminal established—Hydrographic information.**—1. A mooring buoy, together with the legend *Oil Loading Terminal*, will be charted 1.28 miles 097° from the Gp. Fl. light (20°12'59" N., 50°19'20" E.).

2. The lighted red can buoy has been moved to position 0.80 mile 122° from the light in (1) and changed to show *Fl. 2 sec.*

3. Submarine pipeline laying and dredging operations in connection with the new oil terminal have been completed; the chart will be amended as follows:

(a) A dashed line will be charted from a shore point 0.98 mile 285° from the light in (1) extending 5.4 miles 270° (on the Plan of H.O. 3699 to the W. border), thence 5.0 miles 180°, thence 3.5 miles 090°, and thence 4.8 miles 028° to the coast of **Jazireh-e-Khark**.

Note.—From position 0.71 mile 235° from the light in (1) the dashed line extends in a 208° direction to the S. border of the Plan on H.O. 3699.

(b) The legend *Prohibited Anchorage* will be charted within the area enclosed in (a).

(c) The legend "Pipeline Area" (29°11'30" N., 50°16'00" E. approx.) together with the boundaries of the same will be expunged.

(d) The legend "Dredging in progress" (29°12' N., 50°20' E. approx.) will be expunged.

(Supersedes N.M. 18(2274) 1964.)

(N.M. 44(2032), London, 1964.)

H.O. Charts **3699, 3639** (2, 3a-c).

H.O. Pub. 72, 1960, page 269.

(N.M. 52/64.)

Makar. Several conspicuous low and bare islets and rocks lie on a reef extending east from Nusa Manuk; the outermost rock about 2 miles east of the southeast extremity of Nusa Manuk is especially conspicuous. Lai, an islet off the north entrance of Teluk Buka, is fringed by a drying reef. Batu Telu, a few rocks on the south side of a large reef, lies about 1 mile * southwest of Lai.

In the middle of the bay are two large drying reefs, the eastern named Karang Makemu; north of these reefs is an extensive basin with ANCHORAGE in 5 to 12 fathoms, mud and sand, and good holding ground. The entrance of this basin is about 600 yards wide between the north side of Karang Makemu and the edge of the drying shore bank. In the center of this passage the depth is 15 fathoms.

In approaching the anchorage proceed between the reefs extending from Nusa Manuk and Batu Telu making good course 312° on the white pyramid standing on Tua. Course is changed sharply to northward when Batu Telu is in range with the south point of Lai. When the south point of Lai bears 090°, alter course quickly to 270° and anchor in 11 fathoms when the pyramid bears 337°.

THE COAST between Teluk Buka and Tandjung Pondalaun (Puleh) is high and steep, and the depths are too great for anchoring. The coast between Tandjung Pondalaun and Tandjung Mepe (Piakokoli) is low and rocky; a conspicuous pillar-shaped rock stands on the coast about 3¼ miles north-northeast of Tandjung Pondalaun.

7B-8 NORTH COAST OF PULAU ROTI.—Between Tandjung Tongga, the low, sandy northwest extremity of Pulau Roti, and Baa the coastal reef is broad and monotonous, being interrupted by three islets, Nusa Kodi, rocky and 157 feet high, and the low thickly wooded Dao and Aianah. No detached dangers were found. The monotonous coast between Baa and Teluk Korobafo is broken by Batu

Tremanu, a conspicuous rocky hill resembling a castle about 4 miles northeast of Baa, and a 512-foot summit, about 1 mile south-southeast of Batu Tremanu. Pulau Batuhun, a rocky islet 207 feet high, lies on the coastal reef about ½ mile northeast of Batu Tremanu.

BAA, the residence of a government official, can be seen at a short distance seaward. The roadstead is entirely open to westerly and north-westerly winds, but it affords good anchorage during the Southeast Monsoon. The best ANCHORAGE is with the light structure bearing 148° in 11 to 14 fathoms, mud and sand. A rocky spur from Batu Tremanu is then just visible behind the projecting rocky point with a white patch on it about 2½ miles northeast of Baa. Some detached rocks lie close to the point about 1 mile west of Baa, on one of which a white stone PYRAMID stands; there is also a white stone BEACON on a hill 295 feet high about 700 yards southeast of the light structure. The best landing place at high water is at the pier off Baa.

Provisions in small quantities are available. Vessels visit Baa regularly and it is connected to the general telegraph system by radio.

A LIGHT is shown at Baa.

A LIGHT is occasionally shown from the head of the pier.

TELUK KOROBAFO is entered between Tandjung Unggae and Tandjung Lean and is not always distinguishable. Batu Nusalai, a large reef which is almost dry in places, lies off the entrance of Teluk Korobafo; passage into the bay is made between Batu Nusalai and the coastal reef off Tandjung Lean. The CURRENT in the entrance of the bay can be very strong during high tides.

Good ANCHORAGE can be taken in the sheltered basin, with depths of 5 to 12 fathoms, west of Tandjung Bongama, the south entrance of the narrow passage leading to the inner bay. This narrow passage is not always navigable because of the strong tidal currents.

THE COAST northeast of Teluk Korobafo is fringed by a broad steep-to reef. The rocky islet Nusa Bibi, 39 feet high, lies 3 miles southwest of Tandjung Pukuatu; the bay between this islet and Pulau Roti has very irregular depths, and the best place to ANCHOR here is about $1\frac{1}{2}$ miles west of Tandjung Pukuatu, on a sandbank with depths of 6 to 9 fathoms.

EAST COAST OF PULAU ROTI.—This coast between Tandjung Pukuatu, low and sandy, and Tandjung Mepe (Piakokoli), rocky, has few landmarks. Pulau Usu lies off this coast and is separated from it by Selat Usu. The north entrance of this strait, between Tandjung Mondo, rocky and low, and the north coast of Pulau Usu is fairly broad and affords ANCHORAGE in about 14 fathoms, sheltered from westerly winds. The strait itself is encumbered with islets and dries in parts, so is only navigable for small craft. The east coast of Pulau Usu is steep and rocky; Tandjung Okabibi, at the northeast end, should not be approached within at least 1 mile because of the reef extending from it.

Teluk Pepela has very irregular depths and vessels entering it must exercise the greatest caution. In the east part there is well-sheltered ANCHORAGE from westerly winds in 13 fathoms, steering for Lakimola, 896 feet high, on the bearing 221° . Anchor when Batu Luak, a mass of rocks on the drying coastal reef, is in range with a flat-topped hill at the head of Tulek Pepela, bearing 272° .

SELAT ROTI.—This strait lying between Pulau Roti and Timor is clear and deep, except on the east side, $2\frac{1}{2}$ miles south of Tandjung Oisina, the southwest extremity of Timor, on which a least depth of 9 fathoms was found. Because of a difficult sea, which occurs often in this vicinity, it is advisable to avoid the above 9-fathom bank and approach the Timor shore no closer than 3 miles.

The TIDAL CURRENTS in the strait may

run with some strength and there is frequently a turbulent sea in the east part.

DANGERS IN SELAT ROTI.—BEATRICE REEFS ($10^{\circ}31' S.$, $123^{\circ}36' E.$) consists of two coral reefs about $2\frac{1}{4}$ miles apart, with deep water between. The east reef has a least depth of 3 fathoms and the west 4 fathoms. They are usually recognized by their discoloration, surf and rips. ANCHORAGE, if necessary, can be taken in 10 fathoms on the north side of either reef; the south sides are too steep.

A rock with less than 6 feet over it lies about $2\frac{1}{2}$ miles north of the eastern Beatrice Reef.

TIMOR—SOUTH AND EAST COASTS

7B-9 SOUTH AND EAST COASTS OF TIMOR—Tandjung Oisina, the southwest extremity of Timor and the northeast entrance of Selat Roti, must not be approached too closely because of the current. The coast east is high and rocky to Teluk Noilmina.

Tandjung Mali, a narrow rocky point, should not be approached nearer than 1 mile because of a shoal spit extending from it. Teluk Sekalak, a small bay east of Tandjung Mali, affords ANCHORAGE in 15 fathoms. There are no bays or harbors which offer shelter in the east monsoon, and the coast is seldom visited. Between Tandjung Oisina and Teluk Sebalak there are several sandy beaches.

TELUK NOILMINA, east of Tandjung Batupitih, is a wide bight with shores which for the most part are low, sandy, and broken by the mouths of several rivers. TANDJUNG BATUPITIH is a steep white cliff 164 feet high and very conspicuous from an easterly direction; about 1 mile north of Tandjung Batupitih on the coast there is a detached mass of rocks which provides a good landmark. The Noil Mina empties into the bay about $2\frac{1}{4}$ miles north-northeast of Tandjung Batupitih between two sand spits, which dry, and on which there is often heavy breakers. There is a bar off the mouth of the river which can be passed by boats at high water.

In strong westerly winds there is good ANCHORAGE north of Tandjung Batupitih in 3 to 5 fathoms, sand and mud. Vessels should approach the anchorage with the detached mass of rocks north of Tandjung Batupitih bearing 317°.

TELUK KOLBANO, backed by high mountains, has a shore consisting of a steep, inclining beach of stones, except in the south part where there is a narrow coastal reef, which dries. Kolbano is located inland behind some palm trees on the west shore of the bay; a conspicuous rock is located on the beach at the north end of the palm trees. Good ANCHORAGE can be taken about 600 yards east of the north end of the coastal reef in depths of 11 to 33 fathoms.

TANDJUNG BATUMERAH (9°52' S., 124°45' E.) is a steep, rocky point, formed by a spur from the mountains. There are several cliffs southwest of Tandjung Batumerah, on which there are conspicuous red and white patches. Northeast of this point the coast is low with a wide plain behind it. Tandjung Wetoh, the south entrance of Moto Besikama, is low; a drying mudbank lies off the mouth of the river.

TELUK MAUBESI is a small bight north of Tandjung Wetoh into which the Mota We Delieh, with its numerous branches and creeks, flows. There is a bar at the mouth of the river and small boats can enter at high water. ANCHORAGE can be taken anywhere off this part of the coast.

The Rio Masin empties into the sea about 8 miles northeast of Mota We Delieh. The river is the boundary between Indonesia and Portuguese territory, and about 220 yards inland on the left bank of the river there is a boundary stone marked "Limite Portugaise A.S. 3".

7B-10 PONTA TAFARA is low but easily recognized by its high tjemara trees; the point ends in a small gravel bank. Kasabauk, 1,253 feet high, and Foho Rem, a military post at an elevation of 1,867 feet, to the westward, stand out well in the foreground against the high mountains inland, which are often covered with

clouds. Ponta Suai, about 5½ miles northeast of Ponta Tafara, is low and fringed by a coastal reef that extends about 600 yards. There is ANCHORAGE west of Ponta Suai in 15 fathoms. A conspicuous military post stands on Ponta Suai. There is also a white column and a flagstaff on the point.

MOTA MASIN.—Mota Masin, the mouth of which is about 7 miles west-southwestward of Ponta Tafara, forms the boundary on this coast between Indonesian and Portuguese Territory.

THE COAST BETWEEN PONTA TAFARA AND PONTA BEACO, about 80 miles east-northeast, is generally low and marshy with high mountains inland. Ponta Manemara (Lalete), a low and marshy point at the mouth of the Rio Sue, can be identified by three hills in the vicinity. The westernmost summit, 1,486 feet high, has a conspicuous tree on it and the eastern summit, 1,391 feet high, has a prominent military post, Fatu Cuac, on it. Betano, a small landing place close northeast of Ponta Manemara, can be recognized by a white column and customhouse.

Ponta Luka, about 10½ miles west of Ponta Beaco, is a low point with a fringing coastal reef. A conspicuous tree stands on a 856-foot hill about 6 miles northwest of Ponta Luka.

PONTA BEACO is a low point, and Beaco, close westward, is conspicuous by its customhouse and a white column. BEACO is one of the most important landing places on the south coast of Timor because of the rich interior and the Viqueque district, which is well populated. Good roads and highways run into the interior.

The approach to the ANCHORAGE off Beaco, which can be taken at any desired depth, can be made with the white column bearing 024°. During the Southeast Monsoon there are very high waves along the coast.

THE COAST BETWEEN PONTA BEACO AND PONTA SEVIVARA, the east extremity of Timor, is hilly with higher mountains inland. Ponta Roro Ai, about 12 miles northeast of Ponta Beaco, is a high, rocky point

formed by a spur from the mountains northward. Aliambata, close west of Ponta Roro Ai, can be identified by a white column. ANCHORAGE can be taken off Aliambata in 10 fathoms with the white column bearing 333° and Ponta Roro Ai bearing 067° .

Ponta Bató Putik consists of white rocks, and about 4 miles west of the point is the village of Iliômar (Elomar) at the head of a small bay. Good landings can be made on the sandy beach off the village. Two PILLARS, in line bearing 026° , lead to the ANCHORAGE in about 4 fathoms.

PONTA LORÉ (SU LORO), about 11 miles east-northeast of Ponta Bató Putik, is low, and close west of the point is SAENAMO (LORÉ), one of the most important landing places on the south coast of Timor. The conspicuous house of the manager of the sawmills, at an elevation of 40 feet, is located northwest of Ponta Loré. A channel through the coastal reef, about 140 yards wide, leads to the landing place at Saenamo, which is sheltered in both monsoons. Two PILLARS in line bearing 350° lead through the middle of this channel.

ANCHORAGE can be taken in 10 fathoms

with the pillars in range 350° and Ponta Loré bearing 084° . Small craft can anchor in the channel, which is always calm.

ILHA JACO, lying off the east end of Timor, is a small, flat, uninhabited island, 266 feet high, with rocky coasts; the island is a good landmark from the east.

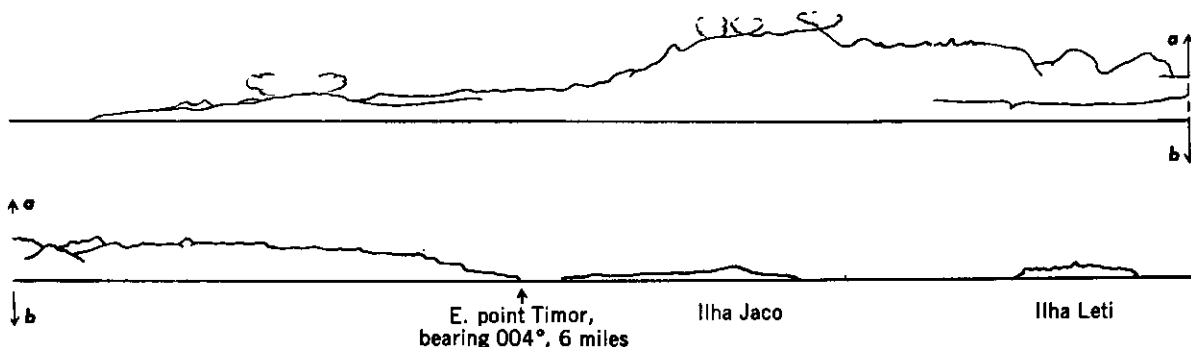
It was reported (1963) that Ilha Jaco was a good radar target at a distance of 9 miles.

Jaco Strait, lying between Ilha Jaco and Timor, is about 660 yards wide with depths of 13 to 15 fathoms at its narrowest part. The TIDAL CURRENTS run directly through the passage at a maximum rate of 3 to 4 knots and appear to continue longer north than south; strong eddies are found in both entrances.

PONTA SEVIVARA, the east extremity of Timor, is a high, flat mountain ridge ending in a perpendicular bluff, outside of which the land slopes down to the sea for about another mile.

TIMOR — WEST AND NORTHWEST COASTS

7B-11 PULAU SEMAU ($10^{\circ}14'S$, $123^{\circ}23'E$), separated from the southwest extremity of Timor by Selat Semaui, is a hilly island with no



VIEW, OF EAST END OF TIMOR.

conspicuous summits. The south side of the island, forming the north side of Selat Roti (sec. 7B-8), has good landmarks in its southeast and southwest points. Pulau Merah, lying on the coastal reef on the west side of the bay between the above two points, is a conspicuous reddish-brown island.

The west coast of Pulau Semau between the southwest point of the island and Tandjung Upeoh is steep and rocky, and the coastal reef discolors. Opposite the bare, red hill, 148 feet high, is the small, low Pulau Tabui. It is inadvisable to pass between Pulau Tabui and Pulau Semau. The coast north of Tandjung Upeoh consists of a sandy beach to the rocky Tandjung Bolang, with the exception of Karang Besar, a rocky peak. TIDAL CURRENTS and very strong tide rips, especially off Tandjung Upeoh, make traffic inadvisable along the west coast of Pulau Semau.

TANDJUNG KURANG, the north extremity of Pulau Semau, is steep and fringed by a coastal reef which shows discoloration.

A LIGHT is shown close south of Tandjung Kurang.

SELAT SEMAU.—This strait is deep and clear, with the exception of a 2-fathom patch in the middle of the bight between Tandjung Tenau (Fenot), the northeast entrance of the strait, and Tandjung Lelindo, 4 miles southwestward. The safest course through the strait is in midchannel.

Strong CURRENTS run through the strait, but the south-going current does not continue as long as the north-going. The current is seldom stronger than 3 knots. Tandjung Oisini, the southeast entrance of the strait should be given a wide berth as the sea and current rips make steering difficult. Tidal currents often set across the north entrance of the strait.

Teluk Pelikan, on the east coast of Pulau Semau, is entered south of Pulau Kambing, 318 feet high, but is only accessible for small boats because of its narrow entrance.

On the east side of the strait there is anchorage for small vessels off Batubau. The entrance of the basin is south of the detached reef.

HANSISI ROAD.—Hansisi, close west of Tandjung Hansisi, the northwest entrance of Selat Semau, is a coaling station for government vessels. With a small vessel, one may ANCHOR with the red water tank in range with the opening between the two government coal sheds, on the bearing 004°. Large vessels must not anchor closer in than 18 fathoms, because of the steep and sudden shelving of the bottom. Landing can be effected here at all times at the landing steps of a stone pier. In 1941 there was a depth of about 7 feet at the steps, and about 11 feet alongside the pierhead. An extensive area, fouled by wrecks, lies southward of the pier. Provisions and water are brought from Kupang.

TENAU, south of Tandjung Tenau, is a loading place for Kupang and is used during the west monsoon when the seas are unfavorable at Kupang.

Vessels anchoring in Hansisi Road with passengers to disembark usually land them at a short wooden pier at Tenau, connected to the shore by a causeway. A hard, used by landing craft, is located about 200 yards south of the above pier. The recommended ANCHORAGE is about 400 yards northwest of the pier at Tenau, with the head of the pier bearing 124° and Tandjung Tenau 022°. Steam should be kept up in case the vessel drags because of the strong current.

WRECKS.—Four dangerous wrecks lie sunk in an area marked on the chart southwest of Hansisi. A dangerous wreck lies sunk close southwest of the pier at Tenau, and an area of foul ground is located about 650 yards west-northwest of the same pier.

A LIGHT is occasionally shown from November to April on the head of the pier at Tenau.

7B-12 TELUK KUPANG is entered between Tandjung Tenau and Tandjung Pakulak,

which is sandy and wooded. The depth in the middle of the entrance is over 30 fathoms, shoaling gradually to eastward. At the head of the bay is a swampy plain overgrown with mangroves.

Pulau Kera, in the center of the entrance of Teluk Kupang, is a small island, 59 feet high, and is entirely covered with coconut trees; a conspicuous tree stands on the northwest coast of the island. The island is fringed by a reef, which dries, and shows discoloration on the north side; surf is usually found here.

A FOUL AREA is located about $\frac{1}{4}$ mile north of the head of the pier at Kupang.

NAVIGATIONAL AIDS.—A light is shown on the west entrance of the river at Kupang, and another light is occasionally shown on the head of a pier extending from the east entrance of the river. The harbor office is located close south of the west entrance point of the river.

A white stone pyramid stands on the coast about $\frac{1}{2}$ mile northeast of Kupang. A light is shown from this pyramid when vessels are expected to arrive.

ANCHORAGE is available during the Southeast Monsoon in 10 fathoms, mud, with the light on the west entrance of the river bearing 150° and the white stone pyramid 083° . In the west monsoon it is better to anchor somewhat farther from the shore in about 18 fathoms. If vessels can not remain in the road because of strong westerly or northerly winds, they will be sheltered in Hansisi Road (sec. 7B-11) or in the north part of Teluk Kupang south-southwest of Burung.

The narrow entrance through the reef is suitable for small coasters and is about $10\frac{1}{2}$ feet in depth at HW neaps. There are two mooring buoys 200 yards offshore in a depth of 9 feet.

Landing at Kupang is difficult with westerly or northerly winds because of the surf; at high water it is best to enter the river and at other times to land at the stone steps about 220 yards east of the harbor office. During the Northwest Monsoon landings can be made at Tenau in

Hansisi Road. A road and telephone connects these two places. Kupang is used for cargo operations for about 7 months of the year; Tenau being used from December to April.

KUPANG, the capital of Indonesian Timor and the residence of a government official, is located on a small plain at the mouth of a river.

There is a ramp and a short wooden pier with a depth of 8 feet at its head. There are a few lighters and towing launches, four sheds with a total of 6,750 square feet of storage space, but no cranes.

Provisions and ice are available. A radio station is located at Kupang, and vessels visit the port regularly. There is a port doctor and a hospital available, and there are facilities for fumigating and disinfecting. See appendix for Climatological Tables.

THE COAST NORTH OF TANDJUNG PAKULAK to Tandjung Berate is steep and rocky, with an occasional sandy beach. Between the latter point, easily recognized by a large and dark loose rock west of the point, and Tandjung Kurus there is a wide bight with many sandy beaches, with Barate village in the south part. Ajer Kosambe, a drying reef marked by an unofficial BEACON, is located about $11\frac{1}{4}$ miles northeast of Barate. There is ANCHORAGE north of Barate in $6\frac{1}{2}$ fathoms, mud, with the beacon on Ajer Kosambe bearing 080° . Tandjung Kurus has a bare, red hill on it, 220 feet high.

Fatu Bena, a conspicuous pillar-shaped rock, lies close off the coast in the bight between Tandjung Kurus and Tandjung Mas, in position about $3\frac{3}{4}$ miles northeast of Tandjung Kurus. Tandjung Mas has a very steep hill, 305 feet high, on it.

The coast between Tandjung Mas and Tandjung Gunuk is very steep-to, and anchorage is impracticable until within 2 miles of the latter point.

CAUTION.—Because of irregular currents and tide rips off the points between Tandjung Pakulak and Tandjung Gumuk vessels should not approach them within $\frac{1}{2}$ mile.

7B-13 TANDJUNG GUMUK ($9^{\circ}30'$ S., $123^{\circ}48'$ E.) is a low spur of a conspicuous hill,

1,204 feet high. A reef extends some distance from Tandjung Gumuk, and vessels should give the point a berth of at least 1 mile because of the frequent tide rips. NAIKLIU, 2 miles east of Tandjung Gumuk is easily recognized by a flag pole, and ANCHORAGE can be taken north of the village in 15 to 16 fathoms, sand and mud.

COAST.—In the bight between Tandjung Naisoneh and Tandjung Nailot (Noilloi) a conspicuous large black rock, Oilkabesa, stands on the beach.

Batu Anjo, a rock which dries, lies about 2 miles southwest of Tandjung Nasikonis (Tobo) and $\frac{1}{2}$ mile offshore.

NOTE.—From a position about $2\frac{1}{2}$ miles east-northeastward of Tandjung Nasikonis to a position about 28 miles further to the east-northeastward a Portuguese enclave embraces the coastline.

PULAU BATEK, a conspicuous islet of white limestone and 269 feet high, lies about 5 miles north of Tandjung Nasikonis.

There is good ANCHORAGE off Citrana (Sutrana), about 6 miles east of Tandjung Nasikonis, in 22 fathoms, sand.

Vila Taveiro (Pante Makassar) affords anchorage in 22 fathoms, sand, about 400 yards offshore. Two LIGHTS are occasionally shown at Vila Taveiro, and two beacons form a cross mark.

WINI, a village about 4 miles east of Ponta Sacato (Lusan Batu), lies on the west shore of a small bight entered between Tandjung Banuru and Tandjung Tapena, the west and east entrance point, respectively; both of these points are low. A drying reef extends about 550 yards north from Tandjung Tapena, and a $3\frac{3}{4}$ -fathom patch lies $\frac{1}{2}$ mile farther northward.

Vessels approaching the roadstead should steer with Hoi Musu, a 4,045-foot summit about 4 miles south of Wini, in line 193° with a white pillar on the coast, and then ANCHOR in about 16 fathoms, sand, about 330 yards offshore. This range leads close east of a 2-fathom patch lying close northeast of Wini.

MALINTAH, about 12 miles east-northeast of Wini, affords ANCHORAGE to vessels with

local knowledge. A tree, painted white, stands on the low coast between some cargo sheds. A detached reef, difficult to distinguish at high water, lies northwest of the tree with its outer edge about 800 yards offshore. The anchorage should be approached from a position well to seaward with the painted tree bearing 157° .

COAST.—Tandjung Tuameseh (Tuwak Meseh), a low headland about 4 miles north-northeast of Malintah, can be recognized by several patches of white rocks on its east end. In the vicinity of Atapupu, about 10 miles north-east of Tandjung Tuameseh, the coast is fringed by a coastal reef, and between Atapupu and Caxias do Extremo (Batu Gadeh), about 7 miles farther east-northeastward, the coast is overgrown with mangroves varied with sandy beaches.

NOTE.—The boundary between Indonesia and Portuguese territory reaches the coast at a position about 5 miles east-northeastward of Atapupu.

ATAPUPU lies at the head of a narrow inlet in the coastal reef on the east side of the mouth of a river; the coastal reef projects about $\frac{1}{2}$ mile from the shore. There is a narrow, but deep passage through the reef, widening out to a basin about 600 yards broad, with depths of $3\frac{1}{4}$ to 8 fathoms, forming the inner roadstead.

A ridge of hills rises on either side of this inlet, and in approaching the inner roadstead one sights a white monument at Atapupu, which, in range with the highest point of the east side of the cliff of Fatu Kadua (sec. 7B-2), bearing 164° , leads into the inner road.

The entrance of the inner road is about 175 yards broad, but this is considerably reduced by a 1-fathom patch on the west side of the above range; this 1-fathom patch is marked by a BEACON with a topmark consisting of two white balls. A BEACON with a black cone topmark marks the west side of the coastal reef on the east side of the entrance, and a BEACON with a white ball topmark marks the west side of the entrance. A BEACON, marking the edge of the coastal reef, stands on the west side of the inner road, about 600 yards north-northwest of the monument. A stranded WRECK

(6297) **EAST INDIES—Borneo—East coast—Darvel Bay—Light established.**—Sakar Island Light, showing *Qk. Fl. R. 18 ft. 3 M.*, has been established in (approx.) $4^{\circ}59'08''$ N., $118^{\circ}22'48''$ E.

(N.M. 40/66.)

(N.M. 33(1446), London, 1966.)

H.O. Charts **2116, 2118.**

H.O. Pub. 112, No. **28731.**

H.O. Pub. 71, 1951, page **276.**

lies on the east side of the inner road about 700 yards north of the monument. Because of the restricted space, it is advisable to moor. Vessels can ANCHOR in the inner road west of the range line in $3\frac{3}{4}$ to $6\frac{1}{2}$ fathoms, mud. During the Southeast Monsoon vessels can also anchor outside the coastal reef on the range in 30 to 40 fathoms.

Atapupu is connected to the general telegraph system through the radio station at Kupang by telephone. There are two small wooden jetties with a depth of about 10 feet at the heads, but no other port facilities. Vessels visit the road regularly.

CAXIAS DO EXTREMO (BATU GADEH) lies in a plain surrounded by mountains. Vessels can ANCHOR about 300 yards off the village in 11 fathoms, sand and mud, with the flagstaff bearing 142° and a large rock, close to the coast about 1 mile north-northeast of the village, bearing 033° ; this rock is easily identified from seaward against the green background. The depth deepens rapidly to seaward.

The RIO LOIS (MOTA LOËS) flows out through a large plain 14 miles north-northeast of Caxias do Extremo; the mouth of the river is conspicuous. There is good ANCHORAGE south of the mouth of the river in 22 fathoms, sand, about 300 yards offshore with Ponta Fatu Boro, a rocky point 3 miles northward, in line with the low north entrance of the river, and an isolated hut on the beach about 114° .

TIMOR—NORTH COAST

7B-14 PONTA PARIMBALA ($8^\circ 38' S.$, $125^\circ 07' E.$) is one of several rocky points of the high, rounded coastal section of a bulky range, the highest of which is Gugulu (sec. 7B-2).

Maubara, a village about 5 miles east-northeast of Ponta Parimbala, can be readily distinguished from seaward by a small church and a house, surrounded by a high wall, on the beach. The residence of the military commander on the summit of a hill, is also conspicuous. Vessels can ANCHOR off Maubara temporarily in 28 fathoms with a point about $1\frac{1}{2}$ miles west-southwest of the village in line with a rock

close west of Maubara, and the roads on either side of the house close to the coast open. Strong tide rips may cause a vessel to swing and foul the anchor.

Vila de Liquiçá (Likisa), the residence of a government official, about $7\frac{1}{2}$ miles east of Maubara, can be recognized by a monumental building. Vessels can anchor in 27 fathoms, sand, with the building in line with the customs house on the beach.

DILI, entered between Ponta de Motael (Mau Duki) and Ponta Fatu Cama, is the chief port of Portuguese Timor and the residence of the governor.

The inner roadstead, about $\frac{1}{2}$ mile in extent, is sheltered from seaward by reefs extending from the east and west points of the bay and a large detached reef between them; these reefs mostly dry. There is a narrow passage on either side of the detached reef, the western, about 200 yards broad, being generally used, as in the middle of the east passage there is a small $1\frac{1}{4}$ -fathom patch. A spit with depths of less than 6 fathoms extends westward for about 300 yards from the west extremity of the detached drying reef.

A WRECK, with mast showing, lies sunk in the east end of the inner roadstead, and two stranded wrecks lie sunk along the shore in the east part of the inner roadstead.

NAVIGATIONAL AIDS:—A light is shown on Ponta de Laquebada, at the west end of the roadstead.

The west entrance of the inner roadstead, is marked by two RANGE BEACONS with yellow triangular topmarks and by two buoys, from which lights are shown on request; the buoy on the north side is red and on the south side black.

The west side of the east entrance of the roadstead is marked by a red spherical buoy.

The westernmost of three detached reefs in the inner roadstead is marked at its center by a buoy, painted black with white stripes. The southern detached reef is marked in its north part by a metal framework sphere. The easternmost detached reef is marked in the north part by a similar metal framework sphere.

DIRECTIONS — ANCHORAGES.—Vessels approaching the inner roadstead should steer 180° for the light structure on Ponta de Laquebada until the range beacons on the south shore of the harbor are in range 132°; this course leads through the west entrance, between the two buoys. Thence steer to maintain this course, anchoring as convenient, clear of the reefs in a depth of 11 fathoms.

Anchorage can be taken by large vessels outside the roadstead in 27 fathoms, sand, southeast of a 13-fathom patch lying about 1 mile north of Ponta de Laquebada.

Anchorage can be taken in the inner roadstead in 10 to 13 fathoms, and vessels commonly use both anchors and a stern line to a tree on the beach.

A **PILOT** is available at Dili.

DILI.—There is a lighter pier 90 feet long and a small stone jetty with a depth of about 16 feet at its head. A wharf 400 feet long was reported (1962) under construction on the southwest shore of the harbor. There is one tug of 270 HP, two lighters of 75-ton capacity, and a 5-ton capacity mobile crane.

Provisions are available. Dili is connected to the general telegraph system by radio, and vessels visit the port regularly. There is a hospital at Dili.

Deratting Exemption Certificates only are issued at Dili.

7B-15 THE COAST EAST OF PONTA FATU CAMA is generally low and overgrown with mangroves to Ponta Fatu Lena, except for a steep point lying between the villages of Hera and Metinaro. A rock lies close off this point, and a 5½-fathom patch lies about 2 miles west-northwest of the point. A detached rock lies close to the coast west of Ponta Fatu Lena.

The coast between Ponta Fatu Lena and Ponta Arum (Arron) Belar rises very steeply to Kuri (sec. 7B-2). Ponta Subão (Subang), close east of Ponta Arum Belar is like a steep, black wall and is very conspicuous from eastward.

VILA DE MANATUTO, about 3 miles east-southeast of Ponta Subão, is the residence of a government official and is easily distinguished by a white church with two towers and some houses built on a hill. There is **ANCHORAGE** in about 30 fathoms, gravel bottom.

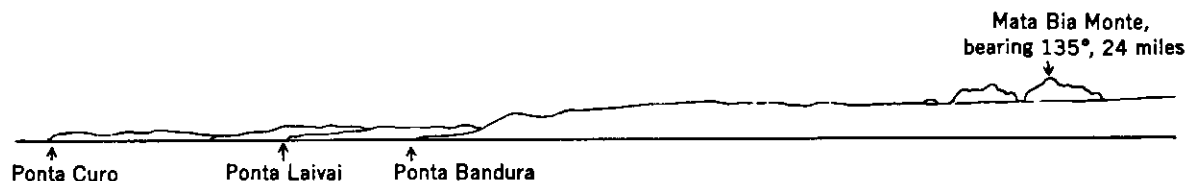
Two **LIGHTS** are shown on request at Vila de Manatuto.

THE COAST between Ponta Subão and Ponta Bigono (8°26' S., 126°22' E.) is hilly; Monte Biroque (Birak), 1,726 feet high, and a 482-foot hill, 3½ miles west-northwest of Monte Biroque, are good landmarks along this stretch of coast. Wemassee village can be distinguished on the above 482-foot hill, and Laleia, to the southwest, is also conspicuous. Ponta Bandura, about 3 miles east of Ponta Bigono, is high and steep, as is the coast between these two points, and it is a good landmark from the east or west.

Between Ponta Bandura and Ponta Chater, about 35 miles eastward, the coast is fairly low, rising gradually to the mountains inland.

VILA SALAZAR (BAUKAU), the residence of a government official, is located a short distance inland at an elevation of 1,047 feet. **ANCHORAGE** is available in 22 fathoms, coral, with a light structure on the coast bearing 212°; vessels lie well here in both monsoons. A conspicuous group of rocks, Fatu Sika, stands close to the coast about 1¾ miles west of the anchorage.

A weekly air service is available from **VILA SALAZAR**.



TIMOR, NORTH COAST. PONTA BANDURA AND VICINITY.

LAGA, built on a hill about $8\frac{1}{2}$ miles east of Vila Salazar, is recognized by a white fort, and there is ANCHORAGE in 17 fathoms, mud, close to the shore, with the fort bearing 158° .

NOVA ANCORA (LAIVAI), built on the hill, affords a well protected ANCHORAGE during the west monsoon in 17 fathoms, coral, with Ponta Laivai bearing 297° and the flag-staff at the fort 227° .

VILA NOVA DE MALACA (LAUTIAM), the headquarters of a military commander, is very conspicuous because of a white fort built on a rocky point. Just east of the rocky point the coast bends, and there are four stone pillars, which were intended as a foundation of a light structure, on the beach. There is good ANCHORAGE during the east monsoon in 11 fathoms, mud, with the four stone pillars bearing 150° .

BETWEEN PONTA CHATER AND PONTA SEVIVARA (sec. 7B-10) the mountains rise steeply from the sea; Ponta Hero is very similar to Ponta Sevivara. Loiquero, about 2 miles southwest of Ponta Hero, is built like a fort and is very conspicuous.

Fairly good ANCHORAGE can be taken off Nava Zazaré, about 4 miles east-southeast of Ponta Chater, in 24 fathoms, stony bottom, with the middle of the rocky point just east of the village bearing 230° and Ponta Apile, about $1\frac{1}{4}$ miles northwest of the village, bearing 310° . The shore abreast the anchorage is steep-to. The anchorage itself is a small natural harbor formed by an opening in the coastal reef. It is available to vessels of up to 2,000 tons, and it offers protection during the west monsoon. The entrance is about 200 yards wide, and is easy to approach.

OMBAL STRAIT

7B-16 OMBAL STRAIT, separating the south coast of the Kepulauan Alor (sec. 7A-10) and the northwest coast of Timor (sec. 7B-11), is almost 17 miles wide at its narrowest part and is apparently free of dangers. It is wide, deep, and clear.

TIDAL CURRENTS.—During the South-east Monsoon the current generally sets from west to southwest, and during the west monsoon in an east to northeast direction. The maximum rate of the current in the strait was 3 knots, and occurred in June with a southwest current.

WETAR STRAIT

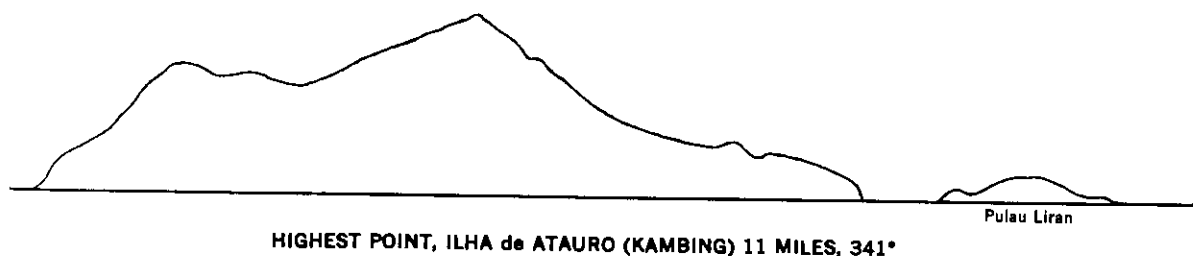
7B-17 WETAR STRAIT, lying between Timor and Wetar, is usually entered from the northwest through the clear channel between Ilha de Ataúro (Kambing) and Pulau Liran, which is locally known as Wetar Passage. The usual east entrance and exit of Wetar Strait coming from or going to the Timor Sea is the clear channel between Pulau Kisar and the east point of Timor.

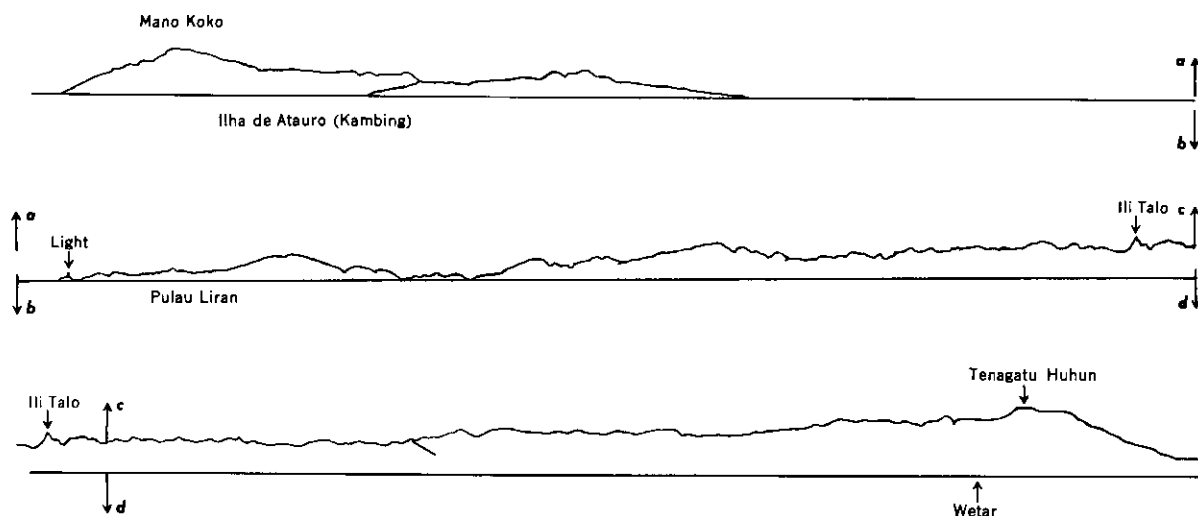
TIDAL CURRENTS.—The current effect is little in the open sea. There is, however, a constant current from the west, which is either augmented or diminished by the monsoon drift.

The tidal currents between Ilha de Ataúro and Timor are weak.

DEPTHS — DANGERS. — There are no known dangers in Wetar Strait, other than Sumatra, outside the 100-fathom curve surrounding the islands.

Sumatra, a 14-fathom patch, the position of which is doubtful, lies about 19 miles east of





NORTH SIDE WETAR STRAIT, LIRAN LIGHT 15 MILES, 300°

Ponta Atunaro, the north extremity of Ilha de Ataúro.

ILHA DE ATAÚRO

7B-18 ILHA DE ATAÚRO (KAMBING) (8°15' S., 125°34' E.), a Portuguese possession, with its steep coasts can be approached very closely. The coasts are barren and have a rugged appearance. The coast in general is exceedingly steep to all around and free of reefs except at Ponta Atunaro (Hatu Naru) where a reef extends about 400 yards offshore.

On the east coast of the island the only suitable anchorage is off Mau Meta, the residence of a government official. Vessels with local knowledge can take ANCHORAGE here in 19 fathoms, sand and stone, with the house in the village bearing 283° and Ponta Bikeli, a point with trees on it close north of Mau Meta, 353°.

PULAU LIRAN

7B-19 PULAU LIRAN, at the northeast entrance of Wetar Strait, is a hilly island consisting of two mountains with lower land between. The island is surrounded by a reef, very broad on its east side; an islet lies on the coast reef off the northeast point of the island. On the west side of the island the coastal reef

is about 550 yards wide. A long narrow shoal with a least depth of 5 fathoms lies close off the west coast of the island.

In 1950, it was reported that a steep-to bank of sand and coral, about ½ mile wide, extended about 2½ miles south from Pulau Liran. The least depth found on this bank was 2 fathoms, with boulders over which there was a depth of 1 fathom. At certain stages of the tide, heavy tide rips were noticeable at the south end of the bank. With the sun astern or above, the bank was distinctly seen, but with the sun ahead it was difficult to make out.

ANCHORAGE during the east monsoon can be taken off the southwest end of Pulau Liran in about 33 fathoms with the light structure bearing 115°, the northwest corner of the island 359°, and the 1,411-foot summit of the island 027°.

A LIGHT is shown on the south point of Pulau Liran.

NAUTILUS REEF, 2 miles north of Pulau Liran, consists of sand and small rocks, with some drying patches of coral. The north and south ends of the reef have coral spots which are readily recognized.

The passage between Nautilus Reef and Pulau Liran is clear, but the north point of Pulau Liran should not be approached closer than 1,000 yards.

SELAT LIRAN.—This passage between Pulau Liran and Wetar is clear, but should not be attempted because of the strong currents; a current of 3 knots was observed. The coastal reef off Pulau Liran is always easily recognized on a clear day by its discoloration.

WETAR

7B-20 SOUTH COAST OF WETAR.—This coast can be approached rather closely, bearing in mind the tide rips off the southwest and southeast points of Wetar. Piblia Tutun ($8^{\circ}01' \text{ S.}, 125^{\circ}48' \text{ E.}$), the southwest extremity of Wetar, rises to an elevation of 948 feet, and then a ridge of mountains extends northeast, the highest peaks of which are conspicuous.

The coast between Pibia Tutun and Gung Tutun consists of sand, gravel, and rocky points; there is a conspicuous point about midway between the above two points. Daielin Tutun, about 15 miles east of Gung Tutun, is low and sandy, and between a low point about $3\frac{1}{4}$ miles farther east and Eden Tutun the coast consists of gravel backed by low hills. **EDEN TUTUN** is a rather low spur of the mountains north of it, and has steep rocky sides. There are heavy tide rips off this point.

Ilwaki, the site of the only suitable anchorage in Wetar, is recognized from a distance by a shed and a few houses; the village is a short distance inland. The **ANCHORAGE**, well protected from the west monsoon and southeast winds, is available in 30 fathoms, sand, with a rocky point, 272 feet high, on the southeast side of the bay, bearing 120° . Vessels visit the road regularly.

THE WEST COAST OF WETAR is alternately steep and sloping, becoming steeper to the northward. Diruru Tutun and Nunnkae Tutun can be identified. Vessels with local

knowledge can take **ANCHORAGE** in Labuan Air Panas, close northeast of Diruru Tutun, in 16 to 22 fathoms, about 350 yards offshore, with a conspicuous white tree bearing 158° .

PULAU REONG, off the northwest extremity of Wetar, is a good landmark and is separated from Wetar by a deep and clear channel; strong currents are encountered here at times.

THE NORTH COAST OF WETAR is steep and rocky, and the many little bays afford few anchorages. Tudjau Tutun, the north point of Wetar and the extremity of a 1,400-foot-high headland, is conspicuous from a considerable distance from east or west. **ANCHORAGE** can be taken in Labuan Makka, about 7 miles west of Tudjau Tutun, in 22 fathoms, sand, with the mouth of the river bearing 128° , and a conspicuous rock west of the river mouth bearing 254° . Another conspicuous rock lies east of the river.

There are several villages along the coast between Tudjau Tutun and Hatuloi Tutun, about 12 miles east-southeastward, but there are swells and heavy breakers during both monsoons along this stretch of coast.

THE EAST COAST OF WETAR between Hatuloi Tutun and Iskanawatu Tutun is steep-to, but there are tide rips and eddies along this part of the coast. The sea is calmer in the bight between Iskanawatu Tutun and Eden Tutun.

PULAU KISAR

7B-21 PULAU KISAR ($8^{\circ}03' \text{ S.}, 127^{\circ}10' \text{ E.}$), a part of the Kepulauan Sermata (See H.O. Pub. No. 73), consists of a number of rocky hills, the highest of which is 787 feet high; these hills are very sparsely wooded. The coasts, which rise steeply from the sea, consists of bare coral lime broken in places where small streams empty into the sea.

ANCHORAGE is available off the southwest side of Pulau Kisar in an open roadstead off Pontai Wonreli. This village, the residence of a government official, is located a short distance

inland. Anchorage can be taken in 16 to 22 fathoms, coral and stones, about 150 yards west-northwest of a white pyramid on the south shore of the bight. Farther offshore the bottom is so steep that there would be danger of dragging the anchor. Sudden squalls make the anchorage dangerous, and during the west monsoon the anchorage is unsafe and communication with the shore is broken. Landings are made at the mouth of a river behind a narrow drying reef which acts as a breakwater. During the west monsoon landings are made at Djawallan on the east side of the island.

PULAU GUNUNGAPI

7B-22 PULAU GUNUNGAPI ($6^{\circ}38'$ S., $126^{\circ}39'$ E.), about 56 miles north of Wetar, is a volcanic island, 925 feet high, in the shape of a cone with bare slopes. Occasionally there is some volcanic action. The island is steep-to and may be approached with safety, but there is no anchorage.

PART C. PULAU TANAHDJAMPEA, KEPULAUAN MATJAN, AND ADJACENT ISLANDS

7C-1 PULAU TANAHDJAMPEA ($7^{\circ}05'$ S., $120^{\circ}40'$ E.), south of Pulau Salajar (sec. 8D-10), lies on a plateau as defined by the 100-fathom curve. The island is high, rugged and very broken on the west side, off which lie many smaller islands. The numerous summits of the island are so nearly of the same height that they are difficult to distinguish except from westward, where the highest peak of the island,

1,703 feet high, is a useful mark for avoiding the dangers to the west-southwest. A steep and rather pointed hill, 1,060 feet high, on the south side of the island is also a very good mark.

During the west monsoon the atmosphere is remarkably clear, and from the neighborhood of Pulau Tanahdjampea, Gunung Lompobatang (sec. 8D-2) in Celebes, and the high mountains of Flores, 90 miles distant, can frequently be seen. In the east monsoon the summits of the higher islands are generally hidden by dark clouds.

The smaller islands west and north of Pulau Tanahdjampea within the 100-fathom curve will be discussed in section 7C-6.

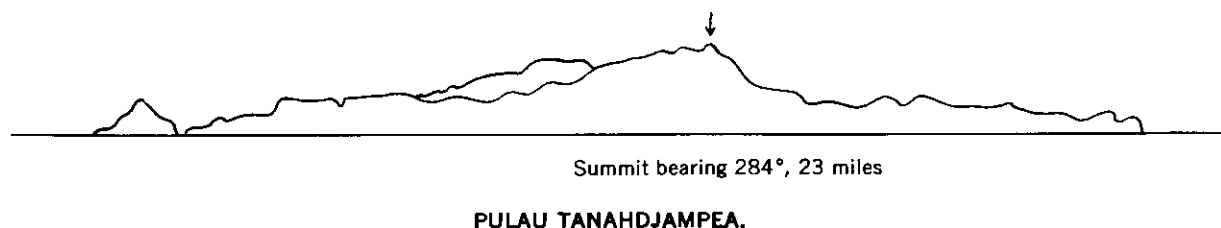
ANCHORAGE can be taken off the entrance of Labuan Marege, on the south side of Pulau Tanahdjampea, in 15 fathoms, although there is little shelter. The anchorage is very limited because of the surrounding shoals.

GENERAL REMARKS

7C-2 Pulau Kajuadi, north of Pulau Tanahdjampea, consists of three hills; Dato Besar, the northern is steep, pointed, densely wooded, and 942 feet high. The middle hill is flatter and only 358 feet high. Dato Kechil, the southern, attains a height of 433 feet. At a great distance the two highest hills appear as separate islands.

Pulau Kalao, southeast of Pulau Tanahdjampea, is a narrow, hilly island, higher at the extremities than in the middle. The west peak attains a height of 886 feet and the east 1,102 feet.

Pulau Bonerate lies off the east end of



Pulau Kalao and has three flat hills, the highest, at the north point, being 492 feet.

Pulau Kalaotoa rises to a height of 1,122 feet on its southeast side and is visible from a great distance. Pulau Madu, south of Pulau Kalaotoa, has a 394-foot plateau near its center.

Pulau Karompa-tjadi, Pulau Karompalombo, and the small islet Giling Sui lie on the east edge of a large drying reef named Taka Lambaena. Pulau Kauna, 148 feet high, lies 15 miles east of Pulau Kalaotoa, and Pulau Kakabia, 125 feet high, lies 34 miles northeast of Pulau Karompa-tjadi.

The Kepulauan Matjan (Tiger Islands), as defined by the 100-fathom curve, is formed by an archipelago of little coral islands; the islands in the north half have large villages and in the south half are bare sandflats. The Kepulauan Pasetalu, at the south end of the Kepulauan Matjan, are covered with coconut palms. Outside the 100-fathom curve two small sandbanks lie off the southeast side of the archipelago, and two large drying areas lie off the northeast side.

DEPTHS—DANGERS

7C-3 The sunken plateau, as defined by the 100-fathom curve, on which Pulau Tanahdjampea lies, extends about 12 miles west and 17 miles north, respectively, of Pulau Tanahdjampea. SANE SANE REEF, at the northwest point of the sunken plateau, and outside the 100-fathom curve, is a partially drying reef of sand, coral, and rocks, with two sandflats on its northeast side, which remain exposed at all times.

Pulau Kalao and Pulau Bonerate lie together on a separate plateau with the 100-fathom curve lying close offshore.

MARIANNE, a drying reef, lies about 8 miles southeast of Pulau Bonerate. The detached dangers lying within the 100-fathom curve south of Marianne show poor or no discoloration. PULAU KAJUPANANG, about 12 miles east-northeast of Marianne, consists of

two small rocky islets, covered with vegetation, lying on the south side of a reef.

Pulau Kalaotoa, Pulau Madu, Pulau Kauna, and Pulau Kakabia are steep-to with the 100-fathom curve lying close offshore. The 100-fathom curve also lies close off Taka Lambaena and the islands at its east end.

PULAU KAUNA is an uninhabited, wooded islet; a small sandflat lies on the drying southeast point of the surrounding coastal reef. A 2½-fathom patch lies within the 100-fathom curve off the north coast of the islet. There is no anchorage available.

PULAU KAKABIA, a rocky island covered with vegetation, is entirely surrounded by a coral reef. Numerous sea birds and rats live on the island, and some of the trees and rocks are white from birds' droppings. A detached drying reef lies close east of the island, with a narrow, deep channel between. There is no suitable anchorage.

PASIR SANGIANG, close off the west end of Taka Lambaena, dries and is very steep-to. PULAU SANGISANGIANG, to the northwest, is a small coral islet, lying on a drying reef.

The reefs and dangers, lying outside the 100-fathom curve, which surrounds the main group of the Kepulauan Matjan will be discussed along with the Kepulauan Matjan.

WINDS—WEATHER

7C-4 See section 5-3.

TIDES—TIDAL CURRENTS

7C-5 See section 6-3.

BANKS WEST AND NORTH OF PULAU TANAHDJAMPEA

7C-6 PULAU TANAHMALALLA (7°05' S., 120°35' E.) is the largest island off the west coast of Pulau Tanahdjampea and is separated from it by a very narrow winding passage with a least depth of 3 feet. The small high islets

Sarimpa and Katella lie on the coastal reef extending north from Pulau Tanahmalalla, and Sambiu and Senapang lie on a detached reef north of Katella; Guru, another small high islet lies close east of Senapang. All of these islets are covered with vegetation. Pulau Bimba, a saddle-shaped islet 436 feet high, lies off the northwest point of Pulau Tanahmalalla, and farther to the north-northwest is the low coral islet Pulau Djailamu, with the small fishing village Sisiri on the southwest side.

Taka Kapalle are extensive reefs, which show good discoloration, at the southwest corner of the bank; the least depth on this reef is 2 fathoms.

On this bank are numerous small coral patches, which discolor poorly. The water generally is so clear that the bottom can be seen at a depth of 5 fathoms. Lana Pasingka, a 3-fathom patch, lies about $1\frac{1}{4}$ miles northeast of Pulau Bimba; a 3-fathom patch lies about 1 mile east-northeast and $\frac{1}{2}$ mile west-southwest, respectively, of Lana Pasingka.

When approaching the bank from the west it is advisable to steer eastward for the conspicuous Pulau Bimba, which appears saddle shaped when seen from northeast or southwest.

BENTENG ROAD, on the west coast of Pulau Tanahdjampea, affords very good shelter for small vessels. The channel to the roadstead, which leads north of Katella, is marked by two BEACONS, each with a white ball topmark, on two detached reefs northeast of Katella, and an unofficial BEACON with a black cone on the edge of the shore reef.

Small vessels may ANCHOR in the basin east of Katella. Strong TIDAL CURRENTS and winds may be encountered. However it is safe during the west-northwest monsoon. Vessels can also anchor north of Katella in 11 fathoms with the southeast point of Guru bearing 066° , the northeast point of Katella 146° , and the west point of Sarimpa 191° . Larger vessels should anchor farther to the southwest

in 14 to 19 fathoms. A government official resides at Katella, and vessels visit the roadstead regularly.

The approach to Benteng Road from the north is made with the center hill of the hills on the east end of Pulau Tanahmalalla in line with Sarimpa bearing 156° ; this bearing is difficult to make out.

ANCHORAGE can also be taken in Labuan Kamajang, southeast of Pulau Tanahmalalla, in 17 fathoms; this anchorage is sometimes difficult because of swell during the east-southeast monsoon. Anchorage may also be found north of Pulau Bimba and Pulau Tanahmalalla, but is unsafe during the west-northwest monsoon.

7C-7 ON THE BANK NORTH OF PULAU TANAHDJAMPEA there are very irregular depths, and three islets between Pulau Tanahdjampea and Pulau Kajuadi. Pulau Batu ($7^\circ 01' S.$, $120^\circ 45' E.$) is 108 feet high, and together with the small rock on its south side is very conspicuous. Pulau Pandjang, 102 feet high, is a small sandy islet, covered with trees, and surrounded by a reef; the islet is visible for some distance. Pulau Tauna (Kauna) is a wooded sandbank surrounded by a large reef and separated from Pulau Kajuadi by a narrow channel.

PULAU KAJUADI rises steeply from the sea on almost all sides and consists principally of three hills (sec. 7C-2). The island is surrounded by a steep coastal reef consisting of sand, coral, and stones. Several reefs of 2 feet to 6 fathoms lie off the west side of the island. Bonelambere is the residence of a native prince, and there is a landing pier at Tunggarana.

During the east-southeast monsoon and during the change of monsoons there is ANCHORAGE off Bonelambere. Vessels approach this anchorage by steering for Dato Besar bearing 144° and anchoring with the north point of Pulau Kajuadi bearing 090° . Good ANCHORAGE during the same monsoon can also be taken off Tunggarana in 27 fathoms with Dato

Kechil bearing 114° and the west extremity of Pulau Kajuadi 005°.

THE PASSAGE BETWEEN PULAU TAUNA AND PULAU PANDJANG is the most recommended for crossing the bank north of Pulau Tanahdjampea; the 1-fathom shoal northwest of Pulau Pandjang is the only danger in this passage.

The passage between Pulau Pandjang and Pulau Batu is not advised, as the bank is broader here and the bottom more uneven. The passage along the north coast of Pulau Tanahdjampea, south of Pulau Batu, is navigable, but there are two 4-fathom patches about 1¾ miles southwest of Pulau Batu, and a 2-fathom patch about 2 miles west of Tandjung Torkubur, the northeast end of Pulau Tanahdjampea. ANCHORAGE can be taken off Garassi on the north coast of Pulau Tanahdjampea in 15 to 16 fathoms close west of the above 2-fathom shoal.

CURRENT RIPS are encountered along the bank north of Pulau Tanahdjampea.

PULAU KALAO AND PULAU BONE-RATE

7C-8 PULAU KALAO (7°18' S., 120°55' E.) has high and steep coasts, and is surrounded by a narrow coastal reef. Temporary ANCHORAGE can be taken off the south coast of the island in 6½ fathoms with the west peak of the island (sec. 7C-2) bearing 039°. A small buoy must first be laid where it is safe to drop the anchor. There is also ANCHORAGE off Beru, at the southeast end of Pulau Kalao, in 38 fathoms; during the west-northwest monsoon vessels lie safer here than off Bonerate.

PULAU BONERATE, much lower than Pulau Kalao, has steep coasts; it is separated from Pulau Kalao by a safe channel about 1 mile wide. The large village Bonerate, the residence of a government official, is a storage place of products for the surrounding islands. A conspicuous thick tree at Bonerate is a useful

mark in entering the road. There is safe ANCHORAGE, during the east-southeast monsoon, off Bonerate in 40 fathoms with the conspicuous tree bearing 112°. A 1-fathom shoal and a 3¾-fathom shoal lie close south and southwest, respectively, of the anchorage.

PULAU KALAOTA, PULAU MADU, AND TAKA LAMBAENA

7C-9 PULAU KALAOTOA (7°23' S., 121°48' E.) is the most important and the most densely populated island of this group. The principal village, Gorau Upa, is located on the southwest point of the island, and ANCHORAGE can be taken off this village with the southwest peak of the island bearing 055° and the two points to the east in range 094°. This anchorage lies close northwest of a 23-foot patch. A village on the west coast of the island can be recognized by a coconut grove.

PULAU MADU, south of Pulau Kalaotoa, has several detached reefs lying near the coastal reef inside the 100-fathom curve. A sandflat with huts on it lies off the southeast end of the island. There is no anchorage.

TAKA LAMBAENA, a large drying reef, is very steep-to, and has a rock above water on its west point, with a small sandbank to the southward. At the east end of Taka Lambaena lie PULAU KAROMPA-TJADI, 197 feet high, PULAU KAROMPA-LOMPO, 272 feet high, and GILING SUI, a low islet covered with vegetation. A conspicuous stranded WRECK lies on the edge of the reef close south of Pulau Karompa-tjadi. Pulau Karompa-lompo is the only permanently inhabited island of the group. Good ANCHORAGE is available off Karompa, at the southeast end of Pulau Karompa-lompo, with the middle of the village bearing 282°, and the east points of Pulau Karompa-lompo and Pulau Karompa-tjadi in range. A long, narrow reef with a least depth of 2 fathoms lies southeast of Karompa.

KEPULAUAN MATJAN

7C-10 RADJUNI KECHIL ($6^{\circ}32'$ S., $121^{\circ}00'$ E.) is the collecting place for copra, which comes from the various uninhabited islets in the group. ANCHORAGE can be taken by vessels with local knowledge off the village on the east coast of Radjuni Kechil. The anchorage can be approached from northward by the passage between Pulau Latundo-lompo (Latundu Besar) and the reef lying to the east. In addition to Radjuni Kechil, there are villages on Pulau Latundo-lompo, Radjuni Besar, Tinabo Besar, and Pulau Djinatung (Djinatu).

The passages across and along the barrier reef inside the 100-fathom curve can be navigated by sight; the large reefs always show clear discoloration, but not always the smaller ones. The differences in appearance of the area at high and low water is remarkable; almost

everything is submerged at high water, and at low water the large reefs all dry.

The KEPULAUAN PASETALU lie at the south end of the archipelago and consists of Pulau Pasetalu-lau (Laut), Pulau Pasetalutangga, and Pulau Pasetalu-raja. These inhabited islands are almost completely covered with coconut palms. In the channels between these islands the TIDAL CURRENT runs north with the rising tide, and south with the falling tide.

KARANG SELA, a drying sandflat, lies outside the 100-fathom curve southeast of the archipelago; another drying sandflat lies southwest of Karang Sela.

TAKA GARLARANG and TAKA LAMUNGAN are two large drying areas east of the north part of the archipelago, and PALAU BELANGBELANG lies close north of the archipelago.

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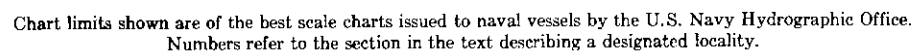
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CHAPTER 8—GRAPHIC INDEX

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2

3

4

5

6

7

8

9

CHAPTER 8

SOUTHEAST AND SOUTH COASTS OF CELEBES

Part A. Southeast Coast—Cape Nederburgh to Red Cape.

Part B. South Coast—Red Cape to Tandjung Buggingkalo, and Off-Lying Islands and Straits Southeastward.

Part C. Teluk Bone.

Part D. South Coast—Tandjung Lassa to Tandjung Laikang, and Off-Lying Islands.

PLAN.—This chapter describes the southeast coast of Celebes from Cape Nederburgh to Red Cape, including the off-lying islands; the south coast of Celebes from Red Cape to Tandjung Laikang, including Teluk Bone, and the off-lying islands. The coastal description is from north to south and east to west.

GENERAL REMARKS

8-1 The southeast coast of Celebes is formed by the southeastern peninsula of the island which separates Teluk Tolo and Teluk Bone. At its extremity are Pulau Mutung and Pulau Muna, beyond which stretch eastward the group of islands called Kepulauan Tukangbesi. All these islands are mountainous but little known.

The southwestern peninsula of Celebes, roughly parallel to the southeastern peninsula, separates Teluk Bone and Makasar Strait. Several islands lie off the southern end of this peninsula.

Mountain ranges run through both of these peninsulas and there are a few conspicuous peaks. There are no ports along this stretch of coast, but there are several small bays where some shelter is afforded.

WIND—WEATHER

8-2 On the southeast coast of Celebes the monsoons are powerful and regular. The south-southeast monsoon prevails from May through October and the north-northwest monsoon from December through March. The south-southeast monsoon is more constant and

somewhat more powerful than the other, but seldom is a wind force greater than 5 met, and then principally during the north-northwest monsoon.

The sky is frequently covered and haze is most common in the latter part of the south-southeast monsoon.

Rain squalls occur all year round, with hard squalls most frequent in December and January. Thunder storms occur most often during April and November, which are the months of the change of the monsoon.

The monsoons on the south coast of Celebes blow with much steadiness, especially the eastern, which begins in the end of April, and blows strongly until October, from east-southeast by day, and under the influence of the land wind, east-northeast at night. The western monsoon commences in December from west-northwest, and is at its height in January, with heavy squalls. In February and March unsteady winds will blow between southwest and north. The land wind is seldom felt at this season.

Rain is most abundant in December and January, lessening in February and March. At

(6298) **EAST INDIES—Borneo—East coast—Darvel Bay—Beacons established.**—Beacons have been established in the following approximate positions as indicated:

- (a) A red, white, and black beacon; $4^{\circ}45'28''$ N., $118^{\circ}16'24''$ E.
- (b) A red and white beacon; $4^{\circ}45'09''$ N., $118^{\circ}19'55''$ E.
- (c) A black and white beacon; $4^{\circ}42'22''$ N., $118^{\circ}15'30''$ E.
- (d) A black and white beacon; $4^{\circ}41'58''$ N., $118^{\circ}15'45''$ E.
- (e) A black and white beacon; $4^{\circ}41'43''$ N., $118^{\circ}15'03''$ E.

(N.M. 33(1445), London, 1966.)

H.O. Chart 2116.

H.O. Pub. 71, 1951, pages 289, 290.

(N.M. 40/66.)

coast stations the rainy period will last until June.

In the east monsoon the sky is hazy, particularly in August and September. During the west monsoon it is generally overcast, and bright periods only occur toward the end of the westerly winds.

CURRENTS—TIDAL CURRENTS

8-3 In the Banda Sea the currents are not usually strong, but are very steady, being largely due to prevailing winds. They are more significant during the south-southeast monsoon than during the other. A rate of 2 knots may be reached during the south monsoon, but as a rule is about $\frac{3}{4}$ knot. During the north monsoon the rate may reach 2 knots, but as a rule is about $\frac{1}{2}$ knot.

Tidal currents, near the coast and narrow passages, will run 1 knot to 2 knots.

For a description of the currents in the Flores Sea see section 5-4.

PART A. SOUTHEAST COAST—CAPE NEDERBURGH TO RED CAPE

8A-1 CAPE NEDERBURGH ($2^{\circ}55' S.$, $122^{\circ}19' E.$) is a high, steep promontory that forms the northwest entrance of Selat Salabangka. A 2,214-foot summit lies about 4 miles eastward of Cape Nederburgh.

BANTAM, a $1\frac{3}{4}$ -fathom patch, lies about $2\frac{1}{2}$ miles north-northeastward of Cape Nederburgh, and a small 3-foot patch lies about the same distance north of the cape.

COAST—GENERAL

8A-2 Between Cape Nederburgh and Tandjung Tampakura, the coast recedes about $6\frac{1}{2}$ miles westward. This stretch of coast is fronted by the Kepulauan Salabangka between which runs a narrow strait. There are no landmarks along this coast.

Between Tandjung Tampakura and Tandjung Nipanipa, the coast is broken and forms

three bays. The interior is marked by lofty and rugged peaks, generally enveloped by clouds and seen only after heavy rains in the Northwest Monsoon. There are several conspicuous mountains along this stretch of coast.

Between Tandjung Nipanipa and Toro Pemali, about 14 miles southeastward, the coast recedes about 10 miles southward forming Teluk Staring. This bay is entirely surrounded by high mountains, with two conspicuous isolated hills on its western side.

Between Toro Pemali and Red Cape, about 17 miles southward, the coast is high and provides good landmarks.

DEPTHS—DANGERS

8A-3 The area within the 100-fathom curve between Cape Nederburgh and Tandjung Nipanipa is full of islets and reefs. Some of the reefs dry and in general show poor discoloration, while the islets near the coast are as a rule, high and of conspicuous form. The coral islets farther offshore are low, but because of dense vegetation are easily recognized at a distance of about 10 miles. Conspicuous trees stand on Pulau Tiga and Pulau Togomagolo. South Reef is the only known danger outside the 100-fathom curve along this stretch of coast.

From Tandjung Nipanipa, the 100-fathom curve encompasses Pulau Wowoni and within this area there are innumerable reefs and drying reefs which show good discoloration. North Saponda is the only danger outside the 100-fathom curve.

OFFLYING ISLANDS AND DANGERS

8A-4 A broad chain of reefs and islands dangerous to approach and terminating in Pulau Manui, extend about 25 miles east and south-east from a position on the 100-fathom curve about $18\frac{1}{2}$ miles southeastward of Tandjung Tampakura. Some of these islands are merely sandbanks covered with low shrubs and others are thickly timbered. Pulau Manui is sur-

rounded by a very steep-to reef, which is broad on the north and northwest sides of the island.

WIND—WEATHER

8A-5. See section 8-2.

TIDES—TIDAL CURRENTS

8A-6 See section 8-3.

COASTAL FEATURES—LANDMARKS

8A-7 SELAT SALABANGKA is a deep strait lying between the Celebes coast, southward of Cape Nederburgh, and the Kepulauan Salabangka. The passage narrows to about 800 yards in the north entrance and has strong tidal currents running through it.

The Celebes coast backing the strait has no landmarks of importance, except a white patch westward of Tandjung Salabangka. Most of the points along the strait are low but are marked by tall vegetation.

The barrier reef along the west side of the north entrance of the strait discolors and is visible because of the area which dries $3\frac{1}{2}$ miles south-southwestward of Cape Nederburgh.

The KEPULAUAN SALABANGKA form the north part of the strait and are low and covered with shrubbery, with the exception of Kepulauan Umbele, on which stands a conspicuous 663-foot hill. The islands are surrounded by a drying reef with many detached reefs.

The KEPULAUAN SINOA, the southeastern group, consists of a few low islands and several rocks, some of which are covered by vegetation and some bare. The whole area shows discoloration, the light green color being visible at a great distance. A conspicuous tree stands on the southernmost island.

PULAU TOGOMOGOLO, about 4 miles to the southward, is low but well marked by a large tree.

DANGERS—NAVIGATIONAL AIDS.—A reef projects about 600 yards westward from Pulau Papado. The outer edge of this reef is marked by a white beacon with a ball topmark.

A $2\frac{1}{4}$ -fathom patch, marked by a black and white horizontally banded buoy with a ball topmark, is located about $5\frac{1}{2}$ miles west-northwestward of Tandjung Baja, a point lying about 5 miles northwestward of Tandjung Tampakura.

A detached reef, marked by a black truncated cone beacon, lies about $\frac{3}{4}$ mile northeastward of Tandjung Baja.

General Pel Reef, consisting of two rocky heads with a least depth of 3 feet of water over it, lies about 2 miles northeastward of Tandjung Tampakura.

Adder Reef lies in the southern fairway, about 2 miles eastward of Tandjung Tampakura, and has a least depth of $2\frac{1}{2}$ fathoms over it.

TIDES.—The nature of the tides in the strait are mixed but predominantly semidiurnal. The semidiurnal tide has springs $2\frac{1}{2}$ days after full and change, and a rise of $4\frac{1}{2}$ feet. Neaps fall the same interval after the quarters, with a rise of $2\frac{1}{2}$ feet.

During the diurnal tides, springs fall $\frac{1}{2}$ day after the greatest declination of the moon, with a rise of 3 feet; neaps 1 day after 0° moon's declination with an unappreciable rise. The spring low waters can coincide about the middle of May and November.

CURRENTS.—Little is known concerning the currents in the strait except that very strong currents may flow, particularly in the narrow section.

DIRECTIONS.—In approaching Selat Salabangka from the northward, bring the white patch westward of Tandjung Salabangka in line $216\frac{1}{2}^\circ$ with the beacon westward of Pulau Papado; the beacon can be rounded within 50 yards. Hold this course until Pulau Hondor, an island lying on a reef about 3 miles south-southeastward of Pulau Papado, bears 107° , thence bring Tandjung Baja in line 120° with Tandjung Tonona. This course passes southward of the buoy marking the $2\frac{1}{4}$ -fathom patch

in midchannel and should not be approached within 110 yards.

Alter course westward, taking care not to pass within 30 yards of the beacon off Tandjung Baja. General Pel Reef is easily passed northward on a course of 120° by keeping Pulau Hon-dor bearing 300° astern. When the summit of Pulau De Haan (sec. 8A-8) is in range with the east side of the western Pulau Dua (sec. 8A-8) bearing 188° , course can be shaped more to the southward in order to clear Pulau Togogolo.

Only vessels with local knowledge should attempt the passage westward of General Pel Reef and Adder Reef.

8A-8 THE COAST SOUTHWARD OF TANDJUNG TAMPAKURA is broken and forms three bays, Teluk Matarape, Teluk Dalam, and Teluk Lasolo. The most conspicuous mountains near the coast are the peaks of Pulau Labengke and Pulau Bahulu, and the mountain tops close to the coast southward of Teluk Lasolo, which are Tinowo, 2,795 feet high, of the Pegunungan Lasolo, the three peaks of the Pegunungan Meluhu, Buldung, 869 feet high, and the Pegunungan Nipanipa, which has three peaks, the highest of which is 1,637 feet high.

The only river of any importance on this part of the coast is the Sungai Lasolo, which discharges with three mouths abreast Pulau Bahulu.

PULAU LABENGKE lies off the high peninsula separating Teluk Dalam and Teluk Matarape, with a clear passage between; both sides of the strait rise steeply from the sea. Three large and several small islands, with several reefs in the vicinity, lie in Teluk Matarape.

REEFS.—A great number of reefs, which continue to be reported, lie in the three bays mentioned above and the chart should be referred to for these. The following dangers lie near the track of vessels using the inner route

from Selat Selabangka to Tandjung Nipanipa (sec. 8A-11).

PULAU DUA ($3^{\circ}16'$ S., $122^{\circ}31'$ E.), two islands, the western one of which lies about $5\frac{1}{2}$ miles south-southeastward of Tandjung Tampakura, are low and covered with high vegetation.

NORTH HINDER, with a least depth of $1\frac{1}{2}$ feet, lies about 5 miles south-southwestward of Tandjung Tampakura.

SOUTH HINDER, a small, round, reef drying at low water, lies about $2\frac{1}{2}$ miles eastward of PULAU VAN LEEUWEN, a conspicuous island off the northeast entrance of Teluk Matarape. A BEACON marks the west side of South Hinder.

A reef which dries, and a rock awash, lie about $1\frac{1}{4}$ miles and 1 mile, respectively, south-eastward of South Hinder.

NORTH BANK, a small drying reef with stones, lies about 5 miles eastward of the north extremity of Pulau Labengke. A BEACON marks its east side. A reef awash lies about $1\frac{1}{2}$ miles northwestward of North Bank, and is marked by a BEACON with a white ball topmark.

SOUTH BANK, about $5\frac{3}{4}$ miles east-southeastward of the north extremity of Pulau Labengke, is $1\frac{1}{2}$ miles long and has a small sand shoal near its north part, partly dry at high water. A BEACON marks the east side of the sand shoal.

SERDANG REEF, with many rocks awash on it, lies about 2 miles northeastward of South Bank.

PULAU DE HAAN, about 472 feet high, lies about 1 mile eastward of Pulau Labengke. A detached reef, sand and coral, with a least depth of 3 feet, lies about $1\frac{1}{2}$ miles eastward of Pulau De Haan.

NORTH REEF, with a least depth of $1\frac{1}{2}$ fathoms, lies about $2\frac{1}{2}$ miles south-southeastward of Pulau De Haan.

SOUTH REEF, with a least depth of 1 fathom and great depths around it, lies about $4\frac{3}{4}$ miles eastward of Tandjung Sawah.

ANCHORAGES.—It was reported in 1944, that there is a good anchorage in depths of about 3 to 6 fathoms on the steep-to shore bank off Tandjung Sawah, the point that lies about $4\frac{1}{2}$ miles northward of Buldung. **CAUTION** should be taken in this area because of the poor visibility of the reefs.

A well protected anchorage, with depths of about 8 to 15 fathoms, was reported to lie, in the north part of Teluk Lasolo, southward of the Sungai Lasolo delta.

8A-9 PULAU MANUI ($3^{\circ}36'$ S., $123^{\circ}08'$ E.), the southernmost island of a group of islands and reefs extending northwestward and westward to Pulau Dua, is rocky and steep-to except on its north and northwest sides. The island is fertile with a few dwellings. Numerous buffalo and goats are found on the island. The island produces rice, rattan, and fruit.

Pulau Pangajarang and Pulau Kokoila are merely sandbanks covered with low shrubs. Pulau Samaringa and Pulau Lunasuala are thickly timbered while Padea-besar and Padea-ketjil are low, partly wooded islands.

The limit of safe navigation northward of these islands is the summit of Pulau Van Leeuwen in range with the north side of the southeastern Pulau Dua bearing 272° until the highest peak of Pulau Manui bears 149° . Padea-besar and Pulau Manui are passed eastward of by then making good course 142° .

ANCHORAGES.—The only anchorage known in this group is off the village of Ulunambu situated on the north coast of Pulau Manui. This anchorage is just inside an opening in the barrier reef, in 29 fathoms, with the east point of Padea-besar bearing 327° and the northeast point of Pulau Manui bearing 096° .

CAUTION is necessary in the western approach to this anchorage until the area between

Padea-ketjil and Padea-besar and Pulau Manui has been examined.

TIDES.—The greatest range of tide in these areas was $6\frac{1}{2}$ feet and the tidal currents were strong in some places.

8A-10 DIRECTIONS.—From a position in the south entrance of Selat Salabangka (sec. 8A-7) with the summit of Pulau De Haan in line with the east side of the western Pulau Dua bearing 188° , a course of between 203° and 210° can be taken to pass at least 55 yards westward of the beacon marking South Hinder. Then alter course to about 173° to pass at least 110 yards eastward of the beacon marking North Bank, thence alter course to pass at least 85 yards eastward of the beacon marking South Bank. When the beacon marking South Bank is in line astern with the east point of Pulau Van Leeuwen, this bearing is followed until course can be shaped for Tandjung Nipanipa.

8A-11 OFF-LYING ISLANDS AND DANGERS.—Between Tandjung Nipanipa and the north entrance of Selat Wowoni (sec. 8A-13), a ridge of broken reefs extend southward and eastward to Pulau Wowoni. The only danger outside the 100-fathom curve is North Saponda. The island is low and covered with high trees. A reef runs about 3 miles westward and 1 mile eastward of the island. Between this reef and the coastal reef extending from Tandjung Nipanipa, there is a channel about $3\frac{1}{2}$ miles wide.

SAPPA DJAMBI BANK, about 5 miles southward of Tandjung Nipanipa, is about $2\frac{1}{2}$ miles in length, the western part of which dries.

SOUTH SAPONDA lies 1 mile northward of Tandjung Laonti and is covered with high trees visible from a great distance. A small reef that dries at low water springs lies 400 yards west-southwestward of South Saponda. A 3-foot shoal patch lies about 3 miles westward of South Saponda.

MIDDLE SAPONDA lies on a large reef extending $1\frac{1}{2}$ miles westward and 3 miles east-

ward. It is low and has several large trees on it. **PULUHARI BANKS**, 4 miles long east and west, and drying in places, lies midway between South and Middle Saponda. They have not been fully examined and new reefs continue to be reported.

LINGORO REEF, with a least depth of $3\frac{3}{4}$ fathoms, lies about 3 miles eastward of Middle Saponda.

OBSTRUCTIONS lie in the channel between South Saponda and the mainland, and across the channel between South Saponda and Puluhari Banks. They also lie eastward of the south end of Sappa Djambi Bank.

The dangers eastward of Lingoro Reef will be discussed with the dangers in the north approach to Selat Wowoni (sec. 8A-13).

SOUTHWARD OF TANDJUNG NIPANIPA, which is a very conspicuous steep point with the emerging reefs nearby discoloring well, the coast curves westward forming a funnel-shaped bay with Pulau Bungkutoko lying in the inner part. Pulau Bakori, about $2\frac{1}{2}$ miles southward of Tandjung Nipanipa, is a low island, showing distinctly against the land behind.

Kendari Newel, to the southward, 695 feet high, is very conspicuous as well as Pegunungan Staring, 1,703 feet high, about $5\frac{1}{2}$ miles farther southward.

TELUK KENDARI indents the land to about 4 miles westward of Pulau Bungkutoko, gradually increasing in breadth, but a broad mud bank fills the inner part. The entrance of the bay lies to the northward of Pulau Bungkutoko in a narrow, winding but deep passage. This passage has a least breadth of 165 yards, not easily recognized, but the reefs on both sides are clearly seen. The passage south of Pulau Bungkutoko dries at low water in the eastern part.

The bay affords fine **ANCHORAGE**, the high surrounding land sheltering it from all winds. There is also a fine anchorage in the

indentation, in the north side of the bay, that lies eastward of the village of Kendari. The north shore is steep; the south flatter; but densely wooded.

KENDARI, the residence of a government official, lies in an inlet on the north shore of the bay near the entrance. The south shore of the town should not be approached closely, as reefs extend out 200 to 400 yards. There is a good landing pier, and boats can lie alongside at low water. Another pier will accommodate vessels up to 220 feet in length. Very good drinking water may be obtained. The town is a storage place for forest products. From April to August the minimum temperature is 70° F. and the maximum 89° F. Vessels call regularly at Kendari.

SIGNALS.—Upon sighting of vessels a cone or a ball is hoisted on the signal post on the west side of Pulau Bungkutoko.

PROHIBITED ANCHORAGE.—Anchoring and fishing are prohibited within 200 yards of a line indicated by notice boards, which mark the landing places of a telephone cable laid across the entrance of the bay westward of Pulau Bungkutoko.

BEACONS mark the south side of the channel into Teluk Kendari westward of Pulau Bungkutoko.

DIRECTIONS.—For directions for approaching Teluk Kendari from northward or southward see section 8A-12.

8A-12 TELUK STARING, lying south-eastward of Teluk Kendari, is entered between Tandjung Wowobatu and Tandjung Laonti and is of little importance. The shores of the bay are fronted by a broad coastal reef and there are several shoals and drying rocks in the bay. A $3\frac{3}{4}$ -fathom shoal in the southeast part of the bay is marked by a red and black horizontally banded conical **BUOY**.

There are several small islands along the shores of the bay, the largest being Pulau Wawasungu, joined to the shore by a drying

reef. On the shore opposite the island is a settlement of the government's forest patrol.

ANCHORAGE may be found everywhere in the bay and there is a good anchorage near Pulau Wawasungu.

TELUK MORAMU is an inlet extending about 2 miles into the coast at the south west part of Teluk Staring. The inlet has general depths of $6\frac{1}{4}$ to 14 fathoms, but there are three dangerous patches, one of which dries, lying in midchannel close inside the entrance.

TIDES AND TIDAL CURRENTS.—The tidal range is from $3\frac{1}{2}$ to $8\frac{1}{2}$ feet. In Teluk Kendari the tidal currents may be strong as well as in various channels between the emerging spots in front of the bay and Teluk Staring.

BEACONS.—The northern channel to Teluk Kendari is marked by No. 4 beacon, which has two black truncated cones, fitted with reflectors; the beacon is located on the north edge of Sappa Djambi Bank. No. 3 beacon, white, is located on the edge of the coastal reef projecting from the north side of the entrance of Teluk Kendari.

The channel leading from Selat Wowoni is marked by two black truncated cone beacons on the south side and two white ball beacons on the north side. One of the black and one of the white beacons is fitted with reflectors. On the south side, No. 1 beacon marks the north edge of a detached reef lying $1\frac{1}{2}$ miles eastward of Tandjung Wowobatu; No. 2 beacon marks the north side of a detached reef lying 2 miles eastward of Pulau Bungkutoko. On the north side, No. 1 beacon marks the south end of a small reef southward of Sappa Djambi Bank; No. 2 beacon marks the west side of Sappa Djambi Bank.

All the reflectors on these beacons were reported (1957) missing.

DIRECTIONS.—From a position on the inner route about 5 miles east-northeastward of Tandjung Nipanipa (sec. 8A-10), with the west side of South Saponda in line with the east side of Middle Saponda, vessels proceeding directly

to Selat Wowoni follow this range until Pulau Bakori bears about 250° . Then alter course east-southeastward until South Saponda is in range with Tandjung Laonti, when course can be shaped for the north entrance of Selat Wowoni passing eastward of Lingoro Reef.

Vessels bound for Teluk Kendari from northward pass through the channel between Tandjung Nipanipa and North Saponda on the range, west side of South Saponda touching the east side of Middle Saponda. When the north side of Pulau Bakori bears 264° , alter course to the west-southwestward passing No. 4 beacon at not less than 200 yards distance. When the black beacon, No. 2, is in range with Tandjung Wowobatu, vessels can head for the entrance of the bay, keeping a midchannel course.

Vessels bound for Teluk Kendari and approaching from Selat Wowoni, the route is southward of South Saponda. When midway between South Saponda and Tandjung Laonti, Kendari Newel may be steered for making good a course of 283° . When North Saponda opens west of South Saponda, steer between the black cone beacons on the south side and the white ball beacons on the north side of the channel. Turn toward the entrance of Teluk Kendari when Kendari Newel is in range with the 1,621-foot summit southwestward and follow the directions as given above.

8A-13 PULAU WOWONI.—The highest points are not conspicuous except the hill on the north coast, 1,545 feet high. The island rises rather steeply from southward, to a plateau with three tops of 2,868, 2,841, and 2,490 feet. The northwest coast is lower with a plain running some distance inland. Tandjung Pamali, the north extremity of the island, has some isolated mountains in the vicinity.

The southeast coast with its small bays offers fairly good anchorage in the west monsoon. Near Kakea one finds the best anchorage. Suitable anchorage can be taken near Dimba and Ladiana on the northeast coast and in Dong-

kalaja bight on the north coast. Safe anchorage in both monsoons can be taken off Langkara village on the northwest coast.

BEACONS.—A white beacon with a ball topmark is situated on the reef extending from Tandjung Bobolio, the southwest point of Pulau Wowoni.

A white beacon with a black ball topmark is situated on the southeast side of the southeastern Lampeapi Reef, about $\frac{3}{4}$ mile west-southwestward of Tandjung Bobolio.

DANGERS IN THE NORTHERN APPROACH TO SELAT WOWONI.—Taka Langgara is an extensive drying reef, extending 3 miles westward from Tandjung Pamali.

East Bank, $1\frac{1}{2}$ miles southwestward of Taka Langgara, consists of several isolated patches with a least depth of 2 fathoms and 7 fathoms between. Middle Bank, 3 miles farther westward, is steep-to on all sides, with a least depth of $2\frac{1}{2}$ fathoms; West Bank, about $1\frac{1}{2}$ miles farther westward and with a least depth of $2\frac{1}{2}$ fathoms on its west extremity, is also steep-to. A continuation of these dangers westward has been discussed in section 8A-11.

SELAT WOWONI ($4^{\circ}06'$ S., $122^{\circ}54'$ E.), lying between Pulau Wowoni and the Celebes coast, has numerous reefs so that only a narrow passage on the west shore is considered safe for navigation. The reefs show poor discoloration.

The only prominent landmarks in the north entrance of the strait is the Pegunungan Pemali lying south-southeastward of Toro Pemali, the northwest entrance point of the strait.

UTARA TJAMPADA AND SELATAN TJAMPADA are two low, wooded islands separated from the Celebes shore by a deep channel. The former consists of two parts joined by a reef drying at low water. Both islands are surrounded by a very steep reef, narrow on the west sides.

A **BEACON**, with a black truncated cone topmark, fitted with reflectors, is on the southeast

point of the reef extending southward from Selatan Tjampada.

TWO BROTHERS, a mile northward of Utara Tjampada and connected to the Celebes shore by a reef, are wooded rocks about 50 feet high.

NORTH REEF, a small reef with a least depth of $2\frac{3}{4}$ fathoms, lies in midchannel about 4 miles northward of Utara Tjampada. It is the only known danger in the north part of the strait.

STEILE CAPE, about $2\frac{3}{4}$ miles southward of Selatan Tjampada and on the Celebes coast, is easily recognized from north and south by two rounded summits behind. **HIGH ROCK**, 1 mile to the southward and $\frac{1}{2}$ mile offshore, is a good mark for navigating the strait.

WEST TWEELING, consisting of two coral heads, 200 yards apart, with a least depth of $1\frac{3}{4}$ fathoms, lies in the fairway $1\frac{1}{4}$ miles northeastward of Steile Cape. The dangers in the strait eastward of West Tweeling are best seen on the chart.

A **BEACON** with a ball topmark and fitted with reflectors marks the northwest side of the north coral head.

RED CAPE (sec. 8B-1), about $5\frac{3}{4}$ miles southward of Steile Cape, is a good landmark. The extremity of Red Cape in range with the west side of High Rock, bearing 183° , leads through the strait.

CURRENTS.—A current of 3 knots may flow through the strait, either in a north direction or a south direction. The changes last only an extremely short time.

8A-14 DIRECTIONS.—From a position on the inner route (sec. 8A-12), vessels pass westward of North Reef and steer south-southeastward until the extremity of Red Cape is in range with the west side of High Rock bearing 183° . This range will lead close eastward of the beacon marking the reef southeastward of Selatan Tjampada and about 200 yards westward of the beacon marking West Tweeling.

Both of these reefs are generally shown by discoloration.

The passage between the Celebes coast and Utara Tjampada and Selatan Tjampada is safe and clear of dangers. The course is midchannel, the least depth 13 fathoms, and the narrowest part, at the north entrance, is about 330 yards across. In the west monsoon violent squalls sometimes blow very suddenly from the mountains of the Celebes and may completely obscure the land. In such weather this channel is not recommended.

Approaching the south entrance of Selat Wowoni from eastward, High Rock should be steered for, bearing northward of 272°, until the highest part of Utara Tjampada bears 339°; then on to the leading mark, 183°.

PART B. SOUTH COAST—RED CAPE TO TANDJUNG BUGINGKALO AND OFF-LYING ISLANDS AND STRAITS SOUTHEASTWARD

8B-1 RED CAPE (4°20' S., 122°54' E.) is a steep rising rock, bare and reddish in color. To the northward the coast is high and steep.

OFF-LYING ISLANDS AND STRAITS SOUTHEASTWARD

8B-2 Kepulauan Tukangbesi are the southeasternmost group of islands belonging to Celebes and consist of a great number of islands, with many groups lying together on the same reef. They are separated from the east and south coasts of Pulau Butung by a deep passage. The mountains of eastern Pulau Butung are not conspicuous and although the chart shows a number of high mountains they are difficult to distinguish at a distance.

On the south coast of Pulau Butung, the middle of three high spits of land is very conspicuous.

Selat Butung lying between the west coast of Pulau Butung and the east coast of Pulau

Muna is about 66 miles in length. The shores on both sides are generally high and heavily timbered with several conspicuous summits.

Selat Tioro lying between the north coast of Pulau Muna and the Celebes coast is about 50 miles in length. The strait is encumbered with countless islands, reefs, and rocks with some clear passages between. Pulau Kabaena westward of Pulau Muna is a steep, mountainous island with two conspicuous summits, the northern of which has five summits.

COAST—GENERAL

8B-3 The south coast of Celebes between Red Cape and Tandjung Buggingkalo, about 80 miles southwestward, is rocky in the vicinity of some of the bays, otherwise it consists of mangroves along the coast, interrupted where rivers run into the strait.

There are some conspicuous peaks along this coast southward of Red Cape and northeastward of Tandjung Buggingkalo.

DEPTHS—DANGERS

8B-4 The 100-fathom curve continues southward from Pulau Wowoni (sec. 8A-3) encompassing all the islands extending southeastward from the Celebes coast between Red Cape and Tandjung Buggingkalo with the exception of Kepulauan Tukangbesi and Pulau Hagedis. In the straits and passages between the islands there are numerous islets and reefs, some of which dry. The dangers between Pulau Muna and the Celebes coast are steep-to and show discoloration.

The Kepulauan Tukangbesi are for the most part surrounded by a steep-to reef, which generally shows good discoloration. Deep water exists between all the islands and atolls which make up the group. Some of the atolls can be seen from a great distance because of the discoloration.

Pulau Hagedis, lying southward of Pulau Butung, is a high island with a narrow, steep-to reef surrounding it. A drying reef lies 4 miles

southward of the east extremity of Pulau Hagedis.

WINDS—WEATHER

8B-5 See section 8-2.

TIDES—TIDAL CURRENTS

8B-6 See section 8-3. The tidal currents in the straits and passages are described with the straits and passages.

KEPULAUAN TUKANGBESI

8B-7 PULAU WANGIWANGI (5°18' S., 123°34' E.) lies in the northwest part of the Kepulauan Tukangbesi and is the largest. The island is hilly and with several other islands lies on an extensive reef.

A very steep drying reef surrounds the entire island, projecting 100 to 600 yards on the north side, and stretching far out to the west and southeastward. Several islands lie on this reef, the largest being Pulau Kambode and Pulau Kamponaone. On the north and east sides of the island a narrow barrier reef, drying off the north coast, and with depths of 1 fathom to 6 fathoms over the remainder, runs parallel to the coastal reef at 200 to 600 yards distance, forming a channel between, with 17 to 25 fathoms water. Several detached shoals and a drying reef lie within the 100-fathom curve off the southeast side of Pulau Wangiwangi.

A LIGHT is shown near the northwest extremity of Pulau Wangiwangi.

ANCHORAGE can be taken in Teluk Wantji, a bight formed between Pulau Wangiwangi and Pulau Kambode and running close to Pulau Midden at the head of the bight, in 25 to 30 fathoms, coral, with the east point of Pulau Midden bearing 137°. This anchorage is abreast the villages of Wantji and Mendati on Pulau Wangiwangi, and Kapetan on Pulau Kambode. A stone pier is built over the drying reef near Mendati.

The TIDAL CURRENTS in Teluk Wantji run in a northwesterly and southeasterly direc-

tion. The rate seldom exceeds $\frac{1}{2}$ knot. A rate of 2 to 3 knots has been observed at the anchorage.

The islands of Kaledupa, Hoga, and Lintea Tiwolu lie on an emerging reef southeastward of Pulau Wangiwangi. There is good ANCHORAGE in about 15 fathoms between Pulau Kaledupa and Pulau Hoga. In the middle of the narrow entrance to this anchorage is a detached drying reef. Vessels should keep to the edge of the sharply discoloring coastal reef off Pulau Hoga. The least depth in this passage which narrows to about 55 yards at the east end of the detached reef is about $3\frac{3}{4}$ fathoms. Natives mark the edges of some of these reefs with stakes.

PULAU TOMEA, lying about 9 miles southeastward of Pulau Kaledupa, is hilly and has a very steep-to coastal reef. Pulau Tolandono, lying on the southwest side of the coastal reef around Pulau Tomea, is low and has a sandy beach on its southwest point.

PULAU LINTEA, southward of Pulau Tomea, is 269 feet high and lies on an atoll-shaped reef with Tokobao, a sandbank covered with vegetation. There is a deep passage between Pulau Lintea and Pulau Tomea, but a strong current runs in it. There is good ANCHORAGE for larger vessels off Usku village on the south coast of Pulau Tomea. Close to the coast are some patches of 2 to $2\frac{3}{4}$ fathoms.

PULAU BINONGKO consists of elevated coral terraces, the northern and southern parts are separated by a lower and narrow indentation. The interior is wild. Popalia is the principal village and the residence of a native prince.

ANCHORAGE can be taken inside the barrier reef off the village of Palahidu on the north coast of the island. The entrance into this basin is about 100 yards wide with a least depth of about 12 fathoms. Depths in the

basin are about 16 to 20 fathoms and it is advisable to moor with both anchors.

PULAU RUNDUMA, the northeasternmost island of the Kepulauan Tukangbesi, lies with Pulau Anano, on a long, narrow reef extending about 6 miles in a northwest and southeast direction. Karang Runduma, southeastward of Pulau Runduma, shows discoloration.

8B-8 REEFS IN KEPULAUAN TUKANGBESI.—Southwestward of the islands of Wangiwangi, Kaledupa, and Tomea are the large atoll reefs Karang Kapotta and Karang Kaledupa, separated from each other by a deep passage about 2 miles broad. There is also a clear, but narrower, passage between Karang Kaledupa and the atoll reef of Pulau Lintea and Tokobao. As a rule the reefs are discolored bright green and can be seen from a great distance.

Karang Kapotta, Karang Kaledupa, and Karang Koka, 15 miles eastward of the south end of Pulau Binongko afford good **ANCHORAGE**. The anchorage in Karang Kapotta is reached by one of the passages on the northwest side; the northern, with 4 fathoms least water is recommended. The approaches to the Karang Kaledupa are in the south part of the reef and are much deeper. Karang Koka has three entrances on the southeast side. The middle one is the deepest and broadest, while the northwestern is encumbered by a patch of 3 fathoms and some rocks.

Karang Koro Maha, 9 miles eastward of Pulau Tomea, is accessible for small vessels. There are two entrances on the northeast side, the eastern being the best.

PULAU HAGEDIS ($6^{\circ}12' \text{ S.}, 122^{\circ}41' \text{ E.}$), about 30 miles southward of Pulau Butung, is 633 feet high. The west and south sides are steep, the northern more sloping, while the eastern consists of a long, sandy point covered with coconut trees. Except off the east point, the surrounding coastal reef is narrow and steep-to.

The only **ANCHORAGE** is in a bight on the

north side of the island, where a ridge with less than 10 fathoms runs about 300 yards from the coastal reef, enclosing a basin with depths of 20 to 24 fathoms. During the west monsoon small vessels can cross the ridge and anchor in the basin, and in the east monsoon vessels lie better outside the ridge. The island is well populated, with two villages and a number of scattered houses.

A drying reef lies about 4 miles southward of the eastern end of Pulau Hagedis.

EAST AND SOUTH COASTS OF PULAU BUTUNG

8B-9 THE EAST AND SOUTH COASTS OF PULAU BUTUNG are separated from Kepulauan Tukangbesi by a deep and clear passage with no known dangers. This passage lies between the drift currents of the Banda Sea eastward of the Celebes, while among the Kepulauan Tukangbesi and along the Butung coast the tidal currents predominate. The horizontal movement of the water is therefore most irregular. It is impossible to foretell its direction at any given time. Although no currents of any importance have been reported it is advisable to keep in mind the possibility of a considerable set in one direction or another.

EAST COAST OF PULAU BUTUNG.—Tandjung Butung, about 7 miles southward of the south extremity of Pulau Wowoni (sec. 8A-13), is the north extremity of Pulau Butung. Tandjung Lakantji, about 8 miles south-southeastward of Tandjung Butung, is rocky and about $2\frac{1}{2}$ miles southward of it is a conspicuous conical summit 1,821 feet high. This peak is very conspicuous from the north and south but loses its sharp character when some distance from the coast. Tandjung Lelamu, Pulau Lelamu, and Tandjung Gusi are not conspicuous unless fairly close inshore. Tandjung Goram is rocky, and Tandjung Mateha and Tandjung Tomara are low points covered with

mangroves. The 459-foot hill near Tandjung Kassolanatumbi is wooded with very high trees.

There is little CURRENT along the coast except along the reefs near Tandjung Lelamu where a tidal current of 3 knots was observed. The flood sets northward and the ebb southward.

TELUK LELAMU, about 4 miles long in a north-south direction, is entered northward or southward of Pulau Lelamu and has general charted depths of $5\frac{3}{4}$ to 19 fathoms. Although the general width of the bay is $\frac{1}{4}$ mile or less, it widens to about $\frac{1}{2}$ mile just westward of the south entrance. Several shoal patches lie in the north part of the bay. The two entrances are narrowed to about 150 yards by the fringing reefs extending from the entrance points and from Pulau Lelamu. The south entrance with charted depths of 11 to 19 fathoms in the fairway is marked by 4 lettered BEACONS.

ANCHORAGES.—Vessels entering Teluk Turumbia (Lakansai) should pass northward of the reefs lying on the south side of the bay and southward of the reef of $1\frac{3}{4}$ fathoms lying about $2\frac{1}{4}$ miles south-southeastward of Tandjung Butung, or else the coast may be held from Tandjung Butung. Two of the reefs on the south side of the bay dry; the outermost lies about $1\frac{1}{2}$ miles from the coast.

TELUK KORO, immediately westward of Tandjung Goram, can be entered without difficulty as far as the island at the head of the bay. All the islands in the bay are mangrove swamps except Pulau Pombelaa, on the west side. A rock lies on the coastal reef near the southeast point of Pulau Pombelaa.

Vessels anchoring in the bight westward of Pulau Pombelaa, must exercise CAUTION, as a reef with $1\frac{3}{4}$ fathoms lies about 1 mile south-

ward of the west point of that island, and two reefs of $1\frac{1}{2}$ and 3 fathoms lie under the coast. There is good anchorage off Bubu village; a reef with $1\frac{1}{2}$ fathoms lies eastward of the village, just outside the 5-fathom curve.

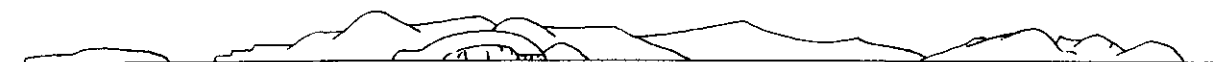
TELUK LAWELU is entirely clear except in the southeast part, where the coastal reef projects some distance and there is a detached drying reef.

TELUK KAMARU is also quite clear except for a 1-fathom reef near the entrance. There is a very good ANCHORAGE off Kamaru village in about 30 fathoms. Kamaru village is located on a conspicuous plateau, and there is a clump of trees close eastward of the village. Between this bay and Tandjung Kassolanatumbi there is anchorage in Teluk Ondola and in the small bay northward of the above point.

TELUK PASARWADJO ($5^{\circ}28' S.$, $122^{\circ}53' E.$) is clear and deep. A good and sheltered anchorage is found in the southwest part of the bay. There is a small wharf, about 180 feet long, where vessels can berth alongside in 6 fathoms in this part of the bay. There are two MOORING BUOYS off the wharf. Vessels ANCHOR about 350 yards off the wharf in 17 fathoms, sand, and load asphalt from lighters. A mobile crane of 4 tons capacity and a motorboat are available. Drinking water is also available.

SOUTH COAST OF PULAU BUTUNG.—This coast consists of three fairly high tongues of land, the middle one ending in a very conspicuous pyramidal hill 1,552 feet high. The coast is clear except for the coastal reef, which projects a little in places.

The two bays formed between the tongues of land have great depths in them and the shores are steep-to. In Teluk Sampolawa, the west bay, there is good ANCHORAGE in 18 to 28



SOUTH COAST OF PULAU BUTUNG Tg. PEMALI (BATU TURO), 7 MILES, 359°

Tg. Pemali

fathoms off the villages on the west shore of the bay. There is a drying part of sand and mud at the head, caused by a river. Teluk Nalandi, the eastern bay, only has anchorage at the head, in about 30 fathoms, close to the coastal reef.

There are strong CURRENTS along the south coast of Pulau Butung, sometimes causing strong eddies off the three tongues of land. A circular current runs in the bays.

SELAT BUTUNG

8B-10 SELAT BUTUNG, lying between Pulau Butung and Pulau Muna is part of the usual coastal route between Selat Wowoni (sec. 8A-13) and Selat Salajar (sec. 8D-9). The shore on both sides is mostly high and heavily timbered, with white patches and precipitous rocks partly wooded rising perpendicularly from the water. At the north and south narrows the strait is about $2\frac{1}{2}$ miles and 650 yards wide, respectively.

DEPTHS in the strait are very irregular. In the north part they vary from 20 to 50 fathoms; in the basin between the North and South Narrows, over 200 fathoms; in the south part 10 to 50 fathoms.

LANDMARKS.—On Pulau Muna the following summits are most conspicuous: Lohia, 541 feet high, and Castle Hill, 528 feet high, behind Teluk Lokea, are conspicuous from the north. Three hills, 778 feet high, abreast the Northern Narrows are conspicuous from the north or south. Castle Peak, 1,393 feet high, near the south entrance, is prominent.

On Pulau Butung are: Porapora Hill, 387 feet high, not easily distinguished against the high land behind; Klokberg and Tallo, 1,578 and 1,595 feet high, respectively; and Lambolo, 1,496 feet high. A wooded hill, 607 feet high, abreast Pulau Pendek, can be readily distinguished by its green slopes and wooded top. Bombo, 1,247 feet high, is the south peak of a high mountain ridge. It can only be well seen from northward. The summits in the north

part of Pulau Butung are not very clearly defined.

On Celebes are Tawa Tawaro, 832 feet, Gunung Kolono, 1,666 feet, very conspicuous from southward; and a summit ($4^{\circ}28' \text{ S.}, 122^{\circ}-45' \text{ E.}$) of 1,112 feet on the southeast side of a peninsula forming the northeast entrance of Selat Tioro (sec. 8B-17).

WINDS AND WEATHER.—In the Southeast Monsoon, from June to September, it generally blows from southeast with more or less force after 10 a.m. and becomes lighter after about 4 p.m. In some parts of the strait, where the land is high on the Pulau Butung side, particularly in South Narrows, very violent squalls occur. In June, July, and August storms and rains are said to be sometimes experienced. In these months the air is clearer than usual, but in September the wind falls light, with a dense haze over the whole strait. In September and October there is sometimes rain and squally weather over the north part, but fine at the same time in the south, the wind then blowing between northeast and southeast, occasionally extending to north and south. During the Northwest Monsoon the winds vary between west and north, but there is little rain.

TIDES.—The tide is mixed, with a predominating semidiurnal character, strongest when full and change falls about one day before 0° moon's declination, especially in the second half of March and September.

The semidiurnal tide has springs two days after full and change, with a rise of $4\frac{1}{2}$ feet; neaps fall the same interval after the quarters, with a rise of $2\frac{1}{2}$ feet.

The diurnal tide has high water January 1, April 1, July 1, and October 1. Springs fall one day after the greatest declination of the moon, with a rise of $3\frac{1}{2}$ feet; neaps one day after 0° moon's declination with an inappreciable rise. In the second half of June and December these increase to 4 and $1\frac{1}{2}$ feet, respectively,

and in the second half of March and September the rise at springs decreases to 3 feet.

The high waters of both groups can not fall together; the low waters do when full and change falls one day before the moons greatest declination, about the middle of June and December.

The flood CURRENT enters the strait from north and south, meeting near Tandjung Tampunabale; the ebb runs outward in opposite directions. The greatest velocity is 5 knots, in South Narrows, in other parts varying from 1 knot to 3 knots. In the narrow parts violent eddies and countercurrents necessitate great care and watchfulness. Slack water lasts a very short time.

8B-11 NORTH PART OF THE STRAIT.—The north coast of Pulau Butung between Tandjung Butung and Labuan Blanda is very high and steep.

Labuan Blanda is a high wooded island which lies on a surrounding reef. This reef extends 400 yards on the northern side of the island; two rocks above water lie on this part of the reef. There is good ANCHORAGE southwestward of the island, in 8 to 10 fathoms, close to the shore.

The east shore of the strait, between Labuan Blanda and Tandjung Gornea ($4^{\circ}51'S$, $122^{\circ}49'E$.), is low, trees and mangroves growing to the water's edge. Off Tandjung Gornea the coastal reef extends $\frac{1}{2}$ mile, and a small river discharging here discolors the water of the strait for a considerable distance.

The west shore of the strait, between Tandjung Lambiko and Teluk Lokea is low and wooded. It is fronted by a broad coastal reef, with several detached reefs which lie up to 2 miles offshore in places.

NORTH NARROWS.—The east shore of the North Narrows is high and heavily wooded and continues so over the north part of Pulau Butung. Pulau Puning and Pulau Lebuton are low and wooded; the latter is surrounded by

a broad reef with a high rock on it. Pulau Kaholipana is covered with tall trees, and can be seen at a great distance because of the bare white trunks of dead trees.

The west shore is high and steep. Teluk Lokea provides good ANCHORAGE. A 3-fathom shoal lies 400 yards northeastward of the east entrance of Teluk Lokea. The Kepulauan Lima lie to the southeastward of Teluk Lokea and consist of six large rocks, the southern and largest being green in color and very conspicuous from southward. When seen from northward or southward the group appears as a single island. Pulau Dua, two islets, lie on a detached reef with a least depth of 3 feet, close off the coast of Pulau Muna. Karang Banka, a $2\frac{3}{4}$ -fathom shoal, lies about 1 mile eastward of Pulau Dua. Karang Bali, a $2\frac{1}{2}$ -fathom shoal, lies on the west side of the channel, $\frac{3}{4}$ mile offshore. A $5\frac{1}{2}$ -fathom shoal is located about $\frac{1}{2}$ mile east-northeastward of Karang Bali.

RAHA, the residence of a civil administrator and a shipping place for timber, kapok, and forest products, is situated to the northward of Teluk Lokea. The houses and a large galvanized roof in Raha are visible from a long distance. There is a pier about 600 yards long with a flagstaff near the inner end.

A black cone BEACON marks the outer reef, about 1,400 yards from the head of the pier, and a white ball BEACON the edge of the coastal reef northward of the anchorage.

A dangerous WRECK lies about 20 yards eastward of the head of the pier.

There is an ANCHORAGE abreast the pier in 6 or 7 fathoms. Small vessels can anchor in 4 fathoms with the head of the pier bearing 278° . In approaching the anchorage, make good a course of 270° for the head of the pier.

Raha is regularly touched by coastwise vessels. There is connection with the regional telephone system.

8B-12 STRAIT BETWEEN NORTH AND SOUTH NARROWS.—**TANDJUNG TAMPUNABALE**, the extremity of the low spit of land on the east shore, is fringed by a coastal reef which usually discolors. There is good **ANCHORAGE** off this cape, in 8 to 10 fathoms. Lambolo disappears behind the above spit of land when viewed from the west. **GO-SONG KULAGA** is composed of several sand bars and rocks, which discolor when submerged. At low water two of the sand bars emerge, one of them dries 6 feet and can be seen at a great distance because of the white sand.

To the northward of Tandjung Umbulu Suan is a crown-topped tree located on the side of a sloping hill, and is visible only from southward. Pulau Pendek and Pulau Pegate are low wooded islands, beyond which the coast is high and steep.

The west coast is high, steep, and monotonous. Teluk Kemba, between Tandjung Mata Ajer and Tandjung Kemba, runs about 3 miles inland. About 5 miles north-northwestward of the former point is a small wooded hill, well defined against the bare background, especially when seen from northward.

SOUTH NARROWS.—The east shore of the narrows between Tandjung Kalankangan and Tandjung Papremkama is steep and precipitous. Immediately southward of Tandjung Batu Sori is the islet of the same name, composed of a high mass of sandstone, wooded above. Pulau Batu Kapal, abreast Tandjung Kalankangan, rises steeply from the water. The under part is eaten away by the strong current. There is a 65-foot mast on Pulau Batu Kapal.

A pier extends from the shore, about 1½ miles northeastward of Tandjung Kalankangan.

The coast between Tandjung Papremkama and Tandjung Kaubula forms a large circular bay, in which lies Pulau Makassar, heavily timbered in the south half.

On the west shore of the narrows Tandjung Barutu is a low, green, wooded point sharply defined when seen against the opposite shore. The coast northward of this point becomes very high and steep. Tandjung Kalandria, the east point of Teluk Kalandria, is low and wooded. A reef extends 800 yards to the southwestward of the point, off which there is good **ANCHORAGE** in 10 fathoms. The coast between Tandjung Baru Baru Koma and Tandjung Pangela is rather low, and a reef extends within the 6-fathom curve, ½ mile in parts.

BAUBAU (5°28' S., 122°37' E.)

8B-13 BAUBAU is the most important town in Selat Butung and is located ½ mile eastward of Tandjung Kaubula. The roadstead is located close northward of the town. The coastal reef dries out to about 400 yards off the town.

WEATHER.—The annual rainfall is 71 inches, the wettest months being December to March, with an average of 10 inches.

CURRENTS.—In the outer roadstead the current follows the direction of the strait. Close to the shore there is a counter current about parallel to the shore and between is an area of irregular currents.

LANDMARKS.—A flagstaff and a white mosque, about 1 mile southward of Baubau, are the most important landmarks in the vicinity and are clearly visible against the mountain slope behind them.

NAVIGATIONAL AIDS.—A light is shown on the head of the landing pier at Baubau.

A mooring buoy for seaplanes is located close eastward of the head of the landing pier.

ANCHORAGE.—There is good anchorage eastward of the mouth of the river in 7 to 24 fathoms. When there are other vessels in the road, it is advisable to moor to avoid collision when swinging at slack water.

8B-14 BAUBAU, the seat of a civil administrator, is a collecting point for local products.

PIERS.—A stone breakwater is built out over the coastal reef. There are several small piers, including one which can accommodate vessels of light draft.

SUPPLIES.—Provisions such as eggs, fowls, and fruit can be obtained.

COMMUNICATIONS.—Vessels call at Baubau regularly. There is connection with the regional telephone system and a radio station.

MEDICAL.—A doctor is available.

SELAT BUTUNG (CONTINUED)

8B-15 SOUTH APPROACH TO SELAT BUTUNG—SELAT MASIRI.—This strait, lying between the Butung shore and Pulau Siumpu, Lewuto Kidi, and Pulau Kadatuang, is quite clear except for a very dangerous, small coral reef with a least depth of $1\frac{1}{2}$ feet lying about midway between the northeast extremity of Pulau Kadatuang and Pulau Butung. The low part near the southwest extremity of Pulau Siumpu in range with the west point of Lewuto Kidi, bearing 199° , leads westward of this reef; it can nearly always be plainly seen by discoloration. These three islands are not usually easy to distinguish against the coast of Pulau Butung.

On the east side of the strait, there is a sloping sandy bottom affording good anchorage. ROUNDTOP, 1,368 feet high, on the east side of the strait, is conspicuous and in clear weather the peak comes into sight as a dark grove.

PULAU SIUMPU has a table summit 951 feet high in the east part, from which a long spur runs down to the westward, with a hill on the outer end, appearing as a separate island from a distance. Papalia, a group of rocks, lies off Tandjung Massiga, the west extremity of Pulau Soumpu; a few of these rocks project above water and many dry. Papalia can be rounded fairly closely. Passina Tongali, a

$21\frac{1}{2}$ -fathom reef off the west coast, is not marked by discoloration. There is an ANCHORAGE in about 24 fathoms off the northwest extremity of the island.

LEWUTO KIDI has a small hill in the middle. The northeast part is low and covered with grass and a few trees.

PULAU KADATUANG is fairly low. There is good ANCHORAGE on the east side, in 7 fathoms, 1 mile southward of the north point; also off the west coast in 22 to 26 fathoms, westward of the northern of two detached rocks on the coastal reef.

SOUTH COAST OF PULAU MUNA.—This coast, forming the north side of the south approach to Selat Butung, is indented by three bays. Teluk Wamboloi, the western, is too shoal to be of any use except for small craft. In the outer part of Teluk Wamboloi ANCHORAGE may be found in over 20 fathoms. In the inner part of the bay the reefs do not show up well because of the reddish-brown color of the water.

Teluk Lasongko, the middle bay, is obstructed by a rocky reef with a least depth of $2\frac{3}{4}$ fathoms which lies between its entrance points. Inside this barrier reef is a spacious basin with depths of 10 to 12 fathoms in its central part, affording many ANCHORAGES. Karang Kaunto, a rock lying on the coastal reef on the west side of the bay, and two smaller rocks to the northward, afford good marks for entering. The barrier reef can be crossed with the western of these two rocks showing between Karang Kaunto and the coast. The greatest depth is found with the eastern rock in range with the west side of Karang Kaunto, bearing 004° .

Teluk Nambo, the easternmost of the three bays, affords good ANCHORAGE.

8B-16 DIRECTIONS.—From a position on the inner route southward of Pulau Wowoni (sec. 8A-14), vessels should hold a midchannel course rounding the north coast of Pulau Butung. The North Narrows is approached with the east point of Pulau Kaholipana in

range with Lambolo, bearing 178° . This course leads eastward of Karang Banka. After passing Karang Banka, alter course to 200° passing midway between Pulau Kaholipana and the Muna coast. When the south side of Pulau Kaholipana bears 090° change course to 225° until Tandjung Tampunabale is in range with Lombolo. A course of 194° , with the center peak of Three Hills bearing 014° astern, will lead through the strait between the North and South Narrows.

Vessels transiting the South Narrows from northward should run it at sight, keeping in midchannel until the point of land east-southeastward of Tandjung Papremkama shows clear of the latter, thence alter course to 187° with the mosque and flagstaff southward of Baubau on that bearing.

Approaching the South Narrows from southward, Pulau Makasser may be steered for, making good course 056° . When the mosque and flagstaff southward of Baubau bears 187° , keep it astern, making good course 007° , passing between Tandjung Baru Baru and Tandjung Papremkama in not less than 10 fathoms. When Tandjung Papremkama is in line with the point east-southeastward, course is altered to 040° steering for Tandjung Kolokama and for Pulau Batu Sori when Pulau Batu Kapal opens out clear from the west shore of the narrows. When the narrows are entirely open, a midchannel course is held until abreast Pulau Batu Kapal, when course is 014° .

SELAT TIORO

8B-17 SELAT TIORO, lying between the north coast of Pulau Muna and the Celebes shore, is an area of countless islands, reefs, and rocks. The reefs and rocks are steep-to with the lead giving little warning, however they are well discolored. All the islands are low except Great Tobea in the northeast entrance and the majority of the islands in the south entrance. Some of the low islands are inhabited. There is considerable prau traffic in the strait.

The east entrance of the strait is on either side of Great Tobea, which lies northward of Tandjung Lambiko (sec. 8B-11). The south limit of the strait is a line extending east-southeastward from Tandjung Peluri ($4^{\circ}54' S.$, $121^{\circ}59' E.$) on the Celebes coast to Tandjung Tattapi on the Muna coast.

The coast of Pulau Muna is practically uninhabited and has no conspicuous points. A 1,906-foot peak and an 850-foot peak in the west and north parts, respectively, of the strait are the most conspicuous on the Celebes coast.

PULAU TAMBAGA, about 4 miles eastward of Tandjung Peluri, is separated from the main coast by a clear channel with a least depth of 4 fathoms, and good ANCHORAGE may be found everywhere here. There is a village on the west side of the island, and a collecting place for forest products with a small wooden pier on the north point. Laora, a village, lies on the Celebes shore northward of Pulau Tambako. There is a pier, 260 yards long, near the village. BATU MANDI, a rock 16 feet high, lies about 1 mile southeastward of Pulau Tambako; in the channel between are two reefs of $1\frac{1}{4}$ and $3\frac{1}{4}$ fathoms.

CURRENT.—Little is known concerning the currents in the strait other than they run either westward and southward of northward and eastward. The maximum velocity is about 2 knots except possibly in the narrower passages.

BEACONS.—A beacon with a white ball topmark marks the north edge of a drying reef about $3\frac{1}{2}$ miles southwestward of Great Tobea.

A beacon marks the south end of a reef about $2\frac{1}{2}$ miles west-northwestward of Pulau Bero Masidi ($4^{\circ}35' S.$, $122^{\circ}18' E.$). A beacon with a white ball topmark marks a reef about 5 miles southwestward of Pulau Bero Masidi.

A beacon marks the west end of a drying reef lying about $4\frac{3}{4}$ miles southeastward of Tandjung Peluri.

Passing through the strait from eastward the beacons with a white ball topmark are left to port.

TELUK WASSOLLANGKA (5°05' S., 122°21' E.) is a shoal bay on the west coast of Pulau Muna between Tandjung Tattapi and a point about 4½ miles northeastward. **BATU AJARRA**, a drying coastal reef, extends about 2½ miles northward from Tandjung Tattapi and is marked on its northwest extremity by an unofficial **BEACON** with a cone topmark and on its northeast extremity by another unofficial **BEACON** with a cross topmark. The south side of a detached drying reef northeastward of Batu Ajarra is also marked by two unofficial **BEACONS**.

A white **BEACON** with a ball topmark marks the edge of the 3-fathom curve off the northwest end of Batu Ajarra, and a black beacon with a cone topmark marks a reef about 6½ miles westward of Tandjung Tattapi.

There is **ANCHORAGE** in about 4 fathoms near the above detached drying reef.

DIRECTIONS.—From a position on the inner route in the north part of Selat Butung (sec. 8B-16), vessels can enter Selat Tioro on either side of Great Toba. From here the usual route leads north and westward of Pulau Bero Masidi and the islands and reefs eastward and southward. Course can then be shaped for the south entrance of the strait. No vessel without local knowledge should attempt to proceed through Selat Tioro.

PULAU KABAENA

8B-18 **PULAU KABAENA** is a steep, mountainous island with a peak, 5,151 feet high, named Sabanpololu, appearing as a cone from the southward. Kameelberg, 3,740 feet high, to the northwestward, is a very conspicuous mountain with five summits. The northwest part of the island is low. The south half of the west coast as far north as Tandjung Malate is fronted by a ridge of reefs lying from 1 mile to 3 miles from the shores; passages through the ridge permit vessels anchoring in deeper water inside. The only village on this

part of the coast is Katuwa, close to Tandjung Malate. The inhabited island Pulau Mataha lies about 1 mile westward of Tandjung Malate; the passage between ends in the broad coastal reef northward of that point. A white ball **BEACON** marks a reef with 1½ fathoms in this passage, and a white conical **BUOY** with a ball topmark, a reef of 3½ fathoms.

PULAU SOGORI, an inhabited island about 4 miles southward of Pulau Mataha, lies on the north end of a large atoll-shaped reef. The entrance of the reef is on its east side over a depth of 3½ fathoms. A great part of the reef dries. A **WRECK** lies on the west side of the reef.

Northward of Tandjung Malate the coast is fronted by a broad, drying coastal reef, with four gullies in it. Teluk Pising, on the north coast, affords good **ANCHORAGE**. The west side of the bay is foul.

Teluk Lingora, in the north part of the east coast of Pulau Kabaena, is clear in the south part outside the 10-fathom curve; a few reefs lie in the north part. Passi Pandolangi, a sand bank with drying rocks on it, lies about 4 miles offshore northeastward of the bay and is marked by a **BEACON** with a truncated cone topmark on the southeast edge. The small islet Dahu Dahu (5°13' S., 122°05' E.), separated from the coast by a deep channel about 300 yards wide, lies 5 miles south by eastward of Tandjung Lingora, the south point of Teluk Lingora; the coast between is clear.

TELUK TALLABASSI, immediately southward of Tandjung Tallabassi, a very steep point, has in its south part Pulau Damalawa-besar, 951 feet high. A 3-foot shoal lies about ¼ mile south-southeastward of Tandjung Tallabassi. Pulau Damalawa-ketjil lies about ¾ mile southward of Pulau Damalawa-besar and has **ANCHORAGE** off it in 9 fathoms, about 200 yards from the coastal reef extending from a small village on the main coast opposite. There is a boat pier northeastward of the village.

PULAU TELAGA-BESAR AND PULAU TELAGA-KETJIL lie off the south coast of Pulau Kabaena and are separated from it by a clear channel with depths of 6 to 14 fathoms in midchannel. Pulau Telaga-besar is low on the western side, but rises to a plateau of 486 feet in the eastern part. Pulau Telaga-ketjil is 453 feet high and has a small village on the northwest side. There is ANCHORAGE in about 28 fathoms, sheltered from southerly winds, off the north side of Pulau Telaga-ketjil, with the northwest point of that island in range with the north extremity of Pulau Telaga-besar.

STRAIT BETWEEN PULAU KABAENA AND PULAU MUTNA.—Numerous reefs, particularly under the Muna shore exist in the strait. The passage through the middle of the strait appears to be clear, with depths of 21 to 57 fathoms. The area near the Muna shore and northward of Tandjung Tattapi is encumbered with reefs and shoals. Navigation in this area is not advised except with local knowledge. The flood current sets northward through the strait and the ebb southward.

CELEBES—COASTAL FEATURES (CONTINUED)

8B-19 BETWEEN TANDJUNG PELURI (sec. 8B-17) AND TANDJUNG BATU, about 12 miles west-northwestward, the hills are close to the coast. The slopes are saddle shaped, being covered with reeds.

PASUDU ($4^{\circ}55' S.$, $121^{\circ}57' E.$), an islet, can be recognized from a great distance by a large tree projecting above the shrubs which cover the islet. It is surrounded by a reef, broad on all sides except the northern, and there is a navigable passage with depths of under 10 fathoms between it and the broad coastal reef projecting from the Celebes shore. It may be approached quite close to its north side.

STRAIT BETWEEN CELEBES AND PULAU KABAENA.—The strait between Pasudu and Pulau Kabaena is about $8\frac{1}{2}$ miles wide and is clear except for a large reef of sand and stones with a least depth of $5\frac{1}{2}$ fathoms

in the middle of the strait. The tidal currents run east and west; the ebb setting westward with a velocity of 1 knot to $1\frac{1}{2}$ knots; the flood setting eastward.

PART C. TELUK BONE

8C-1 TANDJUNG BUGINGKALO ($5^{\circ}51' S.$, $121^{\circ}40' E.$) is a low rounded point with some scattered tall trees on it. Two miles southward of the point is a detached drying reef with irregular depths around. The coastal reef projects 2 miles to the southwestward of the point. A small shoal of $2\frac{3}{4}$ fathoms lies about $4\frac{3}{4}$ miles southeastward of Tandjung Bugingkalo. Eastward of the point the coast forms a wide bight with irregular depths.

COAST—GENERAL

8C-2 TELUK BONE, separating the two southern peninsulas of Celebes, is 87 miles wide at its entrance between Tandjung Bugingkalo and Tandjung Lassa, thence penetrating northward 165 miles. The coastal description for this bay is divided into three sections, east, west, and head and from south to north.

THE EAST COAST OF TELUK BONE between Tandjung Bugingkalo and Tandjung Pakar, the south entrance of Teluk Mekongga, is hilly and fronted by a reef. There are few conspicuous mountains along this part of the coast, but the most noticeable are Gunung Platte, of regular height over a considerable distance and dropping rather suddenly at the end; and a hill, fairly conspicuous from northward, about 11 miles north-northwestward and 15 miles northward, respectively, of Tandjung Bugingkalo and Pakar, 1,299 feet high.

Between Tandjung Pakar and Tandjung Kanoweha, about 19 miles northwestward, the coast recedes eastward to form Teluk Mekongga. Four islands lie across the entrance of the bay. Pulau Padamarang, the largest of the four islands, is mountainous with several conspicuous peaks.

Between Tandjung Kanoweha and Tandjung Tabako, about 44 miles northwestward, the coast is steep and rocky, rising immediately to the high mountains inland.

THE WEST COAST OF TELUK BONE between Tandjung Lassa and Tandjung Timpuluwe, about 68 miles northward, is high, steep, and rocky. There are several conspicuous peaks along this part of the coast and are as follows: Sindjai, 886 feet high, with a broad flat wooded top, about 37 miles north-northwestward of Tandjung Lassa; Meru, two summits 709 and 650 feet high, close to the coast about 10 miles further north-northeastward; Patjongi, 2,658 feet high, inland behind Meru; Tjinnung, a round hill, 824 feet high, and Damara, with a sharp summit wooded with high trees, 499 feet high, about 17 miles northward of Meru.

Between Tandjung Timpuluwe and Tandjung Lokoloko, about 46 miles northward, the coast has no distinctive features either on the coast or the land behind. Northward of Tandjung Lokoloko the aspect of the land quickly changes, important hills rising near the coast and a high mountain range farther inland. Pegunungan Latimodjong, a gigantic range of nine summits reaching a height of 11,286 feet, runs parallel to the coast about 20 miles inland, but the tops are generally lost in the clouds. Near the coast are Babang, about 11 miles northward of Tandjung Lokoloko, and an unnamed conspicuous hill, about $7\frac{1}{2}$ miles further northward.

THE HEAD OF TELUK BONE between Tandjung Djenemedja and Tandjung Tabako, about 29 miles east-southeastward, is low and flat in the northwest part, the mouths of the streams affording the only landmarks. Ridges from the massive Pegunungan Tambuke approach the coast in the north part, and in the low plain eastward are several scattered hills, the most noticeable being Maliowo, with a sharp peak, 1,318 feet high, and Krambua, 650 feet high. The Pegunungan Tambuke have a number of summits assuming fantastic shapes from

some directions, but the highest peaks, 9,782 and 8,160 feet, are seldom free from clouds.

DEPTHS—DANGERS

8C-3 In Teluk Bone the 100-fathom curve lies about 4 to 7 miles off the east and west coasts except off Teluk Mekongga and the coast northward where it extends to about 20 miles offshore and off the southwest coast where it extends to a position about 44 miles northeastward of Tandjung Lassa. Numerous reefs and islets lie within the 100-fathom curve and those that dry near the 100-fathom curve are well marked by discoloration and often break in the Southeast Monsoon.

The head of Teluk Bone, lying within the 100-fathom curve, is greatly encumbered with reefs in the east part. Small, separated and emerging reefs make navigation difficult in the area east of $120^{\circ}34'$ E. and south of $2^{\circ}53'$ S.; on the south by the 100-fathom curve and on the east by a line 3 to 5 miles from the coast.

Pulau Basa, a low island lying about $10\frac{1}{2}$ miles eastward of Tandjung Buggingkalo, lies outside the 100-fathom curve. Two reefs lie northwestward of Pulau Basa and one southeastward; these reefs are generally seen by discoloration and a heavy surf (see sec. 8C-6). The only other danger outside the 100-fathom curve is a $3\frac{3}{4}$ fathom shoal lying about 43 miles northeastward of Tandjung Lassa. The position of this shoal, reported 1950, is approximate.

WINDS—WEATHER

8C-4 The following particulars of winds and weather were gathered from observations made during the survey of Teluk Bone:

In the south part of the west side, from February to April, rain and showers occurred for 28 out of 78 days' observation. The sky was always cloudy, especially in the daytime; the clouds came up with the sea wind in the forenoon, packed in dark masses against Gunung Lompobatang, and burst into rain in the afternoon. Farther northward during December

1903 and January 1904 the wind was mostly west and northwest, quickly raising a troubled sea in the daytime. At the head of Teluk Bone, during July, the wind was weaker and the sea calm.

In the east side of Teluk Bone there appears to be much rain during the Southeast Monsoon. In the end of April and month of May, at the entrance of Teluk Bone, the Southeast Monsoon blew freshly, with squalls and much rain, swell, and sea. The wind was less farther northward, but the rain greater. June and July were very unsettled, with winds from the southeast, but sometimes blowing westward for several days. In August rain gradually ceased, and the weather became more settled.

TIDES—TIDAL CURRENTS

8C-5 At Kadjang, on the west side of Teluk Bone, the tide is mixed with a preponderating semidiurnal character, strongest when full and change falls fully 2 days before 0° moon's declination. When the greatest declination of the moon falls fully 2 days after the quarters, the semidiurnal character is least in evidence.

The semidiurnal tide has springs fully 3½ days after full and change, with a rise of 3 feet; neaps the same interval after the quarters, with a rise of 1 foot.

The diurnal tide has high water January 1, April 1, July 1, and October 1; springs fall 1½ days after the greatest declination of the moon, with a rise of 2 feet; neaps the same interval after 0° moon's declination, with a rise of ½ foot. About the second half of June and December these increase to 3 feet at springs and 1½ feet at neaps and decrease about the second half of March and September to 1 foot at springs.

The high waters of both groups cannot fall together. The low waters fall together in the first half of June and December, when the moon's greatest declination falls 2 days after full and change.

Generally, tidal currents seem to be very insignificant and weak except at the mouths of the large rivers. The direction of the current southward of Teluk Bone is in accordance with the monsoons, being west-going from June to October and east-going from December to May.

EAST COAST OF TELUK BONE

8C-6 THE COAST between Tandjung Buggingkalo and Tandjung Ponopono, about 16½ miles northwestward, is fronted by a broad, drying coastal reef, which generally discolors clearly, for about 5 miles northwestward of Tandjung Buggingkalo to Teluk Paria, then it becomes steep-to and seldom discolors. In the reef close northwestward of Tandjung Buggingkalo there are deep basins at Baru and Soppeh, the latter built on an emerging reef.

TELUK PARIA affords ANCHORAGE for vessels of moderate size in 8 to 16 fathoms, sand. The entrance of the bay between the coastal reefs on either side is about 600 yards wide, and vessels can hold fairly close along the west entrance point, which is covered with mangroves. The point of the coastal reef southwestward of this point is dangerous, as it frequently shows very poor discoloration.

Sopang Hill, 738 feet high, is situated close westward of the bay and is not conspicuous from seaward against the high background.

OFF-LYING DANGERS.—Pulau Basa is a small, low, and thickly wooded island, lying 10½ miles westward of Tandjung Buggingkalo; it is surrounded by a large reef, drying in parts, extending fully 2 miles to southeastward, 1½ miles westward, and about 600 yards to northward.

Lamulu, about 3½ miles south-southwestward of Tandjung Ponopono, is a very steep reef, drying in one part and depths elsewhere of ½ to 1 fathom. The drying part consists of clear, white sand and is about 6 feet above water at lowest tide.

Boisebola, 3 miles farther southward, several parts of which dry, is also steep-to with depths of over 100 fathoms around.

Sopang, 4 miles southeastward of Pulau Basa, is a small dangerous reef with a least depth of 3 feet.

BETWEEN TANDJUNG PONOPONO AND TANDJUNG PAKAR, about 27 miles northward, the coast is hilly and is fronted by a reef drying out $\frac{3}{4}$ mile off Tandjung Tanggetado, about 6 miles southward of Tandjung Pakar, and narrowing to the coast north and south.

A number of small reefs, with depths of 1 fathom to 5 fathoms, lie within the 100-fathom curve at distances of $1\frac{1}{2}$ to $3\frac{1}{2}$ miles offshore. In the south half of this part of the coast and parallel to it are two large reefs. The northern dries in one part, with depths elsewhere of $\frac{1}{2}$ fathom to 4 fathoms; its outer edge is steep-to and lies about $3\frac{1}{2}$ miles from the coast. The southern has three drying parts, with depths of $\frac{1}{2}$ fathom to 4 fathoms. The passage between these two reefs and the coast is impracticable on account of the smaller reefs inside.

About $2\frac{1}{2}$ miles northward of Tandjung Tanggetada is the mouth of the Kali Oko Oko, which is a loading place for timber. Depths of 3 fathoms or less extend about $1\frac{1}{4}$ miles seaward from the river mouth. Shoals, with depths of $2\frac{1}{4}$ and $3\frac{1}{4}$ fathoms, lie about 3 miles west-northwestward and north-northeastward of the river mouth.

A small wooden pier extends from Tandjung Batu Kilat located about 1 mile southward of Tandjung Pakar.

There is **ANCHORAGE** on the southside of the small bay immediately northward of Tandjung Towari, about 5 miles northward of Tandjung Ponopono, in 20 fathoms, mud, 200 yards from the coastal reef, with Tandjung Towari bearing 199° . Close northward of the mouth of the Sungai Towari, which discharges north of the bay, there is anchorage in 12 fathoms, mud, with Tandjung Towari bearing 175° .

8C-7 TELUK MEKONGGA.—This bay lying between Tandjung Pakar and Tandjung Kanoweha, about 19 miles northwestward, is navigable in the north part and the south part, south of the parallel $4^\circ 05' S$. should not be attempted because of the reefs and shallow spots. Between the north shore of the bay and the Kepulauan Lambasina there is a navigable channel of 20 to 37 fathoms. The Kepulauan Lambasina, Pulau Padamarang, Pulau Kokosan, and Pulau Maniang lie across the entrance.

PULAU PADAMARANG, the largest island in Teluk Mekongga, is mountainous, rugged, and of peculiar shape, forming numerous small bays and conspicuous peaks. The highest summit, near the center of the island, attains a height of 2,303 feet. From the west it forms a saddle with the north peak and from southward with the east peak. The northwestern hill in the north part of the island has a conspicuous sharp hillock on its northeast slope, and between these is a white stony patch on the coast. The island is mostly surrounded by a very steep reef. The west side is clear, except off the points. The small islet Lima, 237 feet high, lies on the reef which extends $\frac{1}{2}$ mile from the southwest point. A bare rock lies on the reef projecting from the southeast point, and Pulau Idju lies off the north point of the island. The little island Lemo lies off the east point of Pulau Padamarang, and is fringed by a drying reef. The passage between is deep but narrow, and it is not advisable to make use of it * on account of the strong current.

LAMBASINA-BESAR has two summits, forming a saddle. The northwestern is 1,053 feet high. Except on the southwest side the island is surrounded by a coastal reef projecting 1,400 yards from the north point in a sharp spit, with deep water immediately outside. The passage between this island and Pulau Padamarang is almost closed.

LAMBASINA-KETJIL is low, the highest summit in the southwest part, being 325 feet. From southward, at about 17 miles distance,

it appears as two low, separate islands. The passage between the Kepulauan Lambasina is about 1,800 yards wide and clear in midchannel.

PULAU MANIANG is 278 feet high and is joined by a drying reef to Pulau Kokosan, 440 feet high. It was reported (1963) that a pier is located on the northeast side of Pulau Maniang and that a vessel anchored in 19 fathoms about 1 mile north-northeastward of the pier. It was also reported that two stakes, from which **LIGHTS** are shown at night, stand on points near the anchorage.

DANGERS—BEACONS.—Karang Padamarang, about $1\frac{1}{2}$ miles north-northwestward of Pulau Idju, is a round coral reef of about 400 yards diameter, and dry at low water. It is marked on its south side by a beacon with a black cone topmark.

Karang Bingkoka, about 200 yards in diameter, dries at low-water springs and lies $1\frac{3}{4}$ miles west-southwestward of Kolaka. It is marked on its north side with a beacon with a white ball topmark.

An obstruction lies about 1 mile southeastward of Karang Bingkoka.

Karang Kolaka lies northward of the anchorage off the village, $\frac{1}{2}$ mile offshore, and is about 600 yards long and 200 yards broad, drying in parts. Close southward of the reef the south point of Lambasina-ketjil is in range with the north point of Lambasina-besar.

A dangerous reef lies about midway between Karang Kolaka and the shore eastward at Kolaka.

Two beacons, each surmounted by a white ball, located on the north edges of small reefs, mark the southwest side of the swept channel leading to Pomalaä. They lie about 2 miles northeastward and $3\frac{3}{4}$ miles eastward, respectively, of the southern extremity of Lemo.

Three beacons, of which the two westerly are each surmounted by a white ball, mark reefs on the northern, southwestern, and eastern sides of the anchorage off Pomalaä, and are located, respectively, about $2\frac{1}{4}$ miles north-northwestward, $1\frac{1}{2}$ miles northwestward, and about 1 mile north-northwestward of the village.

Southward of a line drawn 085° from the north point of Pulau Padamarang the bay is

so full of reefs that it is advisable not to enter this part, though with rising water and clear sight of the reefs it is possible to enter or leave the bay by the passage between Pulau Padamarang and Lemo on one side and Pulau Kokosan on the other.

CURRENTS.—An easterly or westerly current is found north of the islands while a southerly current has been observed east of the islands.

KOLAKA ($4^\circ 03' S.$, $121^\circ 35' E.$) is chiefly a collecting point for forest products and has lively prau traffic. Vessels call here also. A stone pier, about 460 yards long, is located off the village and there is a depth of 1 fathom at its head. Provisions are scarce. Northward of the village near the beach, there is a large dark tree.

There is good **ANCHORAGE** in 15 fathoms, southeast of Karang Kolaka and southwest of the stone pier.

POMALAÄ, a trading place, is located about $7\frac{1}{2}$ miles southward of Kolaka. An approach channel has been swept to a depth of not less than 30 feet, from a position about 5 miles westward of Karang Bingkoka to the anchorage off Pomalaä. There is a pier at Pomalaä. A conspicuous chimney, 148 feet high, stands about $\frac{1}{2}$ mile southward of Pomalaä.

DIRECTIONS.—From southward the highest peak of Pulau Padamarang can be seen from abreast Tandjung Ponopono; keeping it eastward of 000° will pass outside of all dangers. Lambasina-besar may be steered for when sighted, and later the southwest summit of Lambasina-ketjil, taking care to keep the latter bearing northward of 332° , thence passing in midchannel between these two islands, making good a course of 034° . When the north point of Lambasina-ketjil bears 250° , the beacon on Karang Padamarang may be steered for, leaving it to port, course then being shaped to pass between Karang Bingkoka and Karang Kolaka. The southeast summit of Lambasina-besar, in range, bearing 262° , with the sharp hillock on the northeast slope of the northwest summit of Pulau Padamarang, leads between these two reefs.

From the westward the highest summit of Pulau Padamarang bearing 090° should be steered for and then follow the above directions.

8C-8 BETWEEN TANDJUNG KANO-WEHA AND TANDJUNG TABAKO, about 44 miles northwestward, the coast is mostly high, while the mountains of the interior rise almost immediately in back of the coast. The edge of the reefs and emerging spots near the 100-fathom curve make the coast difficult of approach.

Tandjung Ladongi, about 7 miles northwestward of Tandjung Kanoweha, is steep and conspicuous from westward. Tjampea, an island, lies about 1 mile westward of this point. Teluk Paopao is located southeastward of the point and Teluk Lariko northwestward.

TELUK PAOPAO affords good anchorage on the east side, but is open to southwesterly and southerly seas. A steep coastal reef extends from the east shore to about 800 yards, and a 1-foot shoal lies in the northwest part of the bay 800 yards offshore.

TELUK LARIKO, lying between Tandjung Ladongi and Tandjung Lariko, affords good ANCHORAGE on the south side of the bay in about 20 fathoms. The shore of the bay is edged by a narrow steep-to reef. Laburoko, an island 400 feet high, lies in the southeast part of the bay.

OFF-LYING REEFS.—The 100-fathom curve turns away from the coast to westward off Tandjung Lariko, and then probably runs along the outer reefs shown on the chart, approaching the coast near Rosa Marie.

Rosa Marie, a reef of considerable extent lying about 12½ miles westward of Lambasina-besar, breaks heavily, and is estimated to have only a few feet of water over it.

Tamboli, a reef lying about 5 miles north-northwestward of Rosa Marie, is about 1 mile long in a north-by-east and south-by-west direction; the reef dries and is plainly visible by surf. Shoal water, with a patch that nearly dries, extends 1 mile to the southward.

The Dungi Reefs are two small shoals visible a considerable distance under favorable circumstances. They both lie with the southwest summit of Lambasina-ketjil in range with the highest peak of Pulau Padamarang, bearing 121°. The northwestern is circular, about 320 yards in diameter, with a least depth of 1 fathom. The southeastern has a least depth of 1 foot. On the ridge between the two is 9-fathoms least water.

The westernmost reef is narrow, semicircular, with the opening to the eastward, and mostly dries. It lies about 10½ miles west by southward of Tandjung Lariko.

BETWEEN TANDJUNG BATU LAKI AND TANDJUNG TOLI TOLI, the former lying about 6½ miles northwestward of Tandjung Lariko, an almost uninterrupted ridge of drying coral reefs runs at 4 miles and less from the coast. On one of them is a sandbank always above water.

In the small bay, Labuandata, 2 miles southeastward of Tandjung Toli Toli, there is good ANCHORAGE in 20 fathoms for a single ship.

From Tandjung Toli Toli the coast runs northward about 6 miles to Tandjung Tabako.

WEST COAST OF TELUK BONE

8C-9 THE COAST between Tandjung Lassa and Tandjung Labua, about 17½ miles northward, is high, steep, and rocky, the 100-fathom curve running a few hundred yards from the shore. Tandjung Labua is very conspicuous owing to its white rock formation. The coast here can be approached closely but no where does it offer safe anchorage, not even in Teluk Tiro.

KADJANG, the seat of a civil administrator, is located in a small bight about 3 miles west-northwestward of Tandjung Labua. A small stone pier is located in the southeast part of this bight. The most suitable anchorage, in not less than 15 fathoms, is in the bend of the coastal reef north-northwestward of the stone pier.

Vessels touch here regularly, and there is a telephone exchange which connects with the general telephone system. The house of the civil administrator is conspicuous by its flag-staff.

BETWEEN TANDJUNG LABUA AND TANDJUNG TIPPULUWE, about 50 miles northward, the area within the 100-fathom curve is full of reefs which extend a great distance from the coast. A well-beaconed inner passage runs between them and the coast, and is used by vessels visiting Sindjai, and from there to Palima (sec 8C-10).

Between Tandjung Labua and Tandjung Antju, about 19 miles northward, the coast rises steeply to hills about 400 feet high as far as Tandjung Kopang, then begins a stretch of low land to Tandjung Antju. Sindjai is the only good landmark along this part of the coast.

SINDJAI is the seat of a government official, whose house is conspicuous against the dark green hills. Balangnipa is a well-populated village on the Sungai Tangka, which empties about $4\frac{1}{4}$ miles southward of Tandjung Antju, and is connected to Sindjai by a good road. The exports consist of copra, coffee, and hides.

The depths in the road off the mouth of the Sungai Tangka decrease gradually, and **ANCHORAGE** may be found in depths of not less than 5 fathoms. There is good anchorage in 11 fathoms with the mouth of the Sungai Tangka bearing about 292° , fully 1 mile distant, and Beloppo, an ilelet lying off Tandjung Antju, in range with Tjinnung.

ISLANDS EAST OF TANDJUNG ANTJU.—Of the nine islands eastward of Tandjung Antju, Pulau Bulunrue, the southernmost, is the most striking, with its very conspicuous hill, 827 feet high, in the south part, visible in clear weather from Tandjung Lassa and Tandjung Patiro.

Pulau Batanglampe, about $4\frac{1}{2}$ miles northward of Pulau Bulunrue, appears as a saddle from north and south, the west summit being

the highest and most conspicuous. Leang Leang has a village on the southwest side. Lanreanreang is a small coral island with some coconut trees on it. The remainder have no distinctive features.

OFF-LYING REEFS—BEACONS.—A large number of reefs extend from 2 to $2\frac{1}{2}$ miles from the coast between Kadjang and Sungai Barengang, a river about 11 miles north-northwestward.

Melambiri, a drying reef, the east side of which is steep-to, lies about 7 miles northward of Tandjung Labua. Kalang, two $3\frac{3}{4}$ -fathom patches, lie southward of Melambiri.

Malamala, reefs which partly dry at low water, lie to the westward of Melambiri. A beacon with a black truncated conical topmark and a reflector stands on the north reef.

Bunging Keke lies about 2 miles southward of Pulau Bulunrue and is marked by a pyramidal stone beacon with reflectors.

Malilla and Behulu, two reefs, lie on the south side of the approach to the anchorage. Under favorable circumstances the latter can be seen, but the first, with 3 fathoms water, gives no indication of its existence.

CAUTION.—Because of the great number of new shoals and reefs in this vicinity, it is advised to use the greatest care in navigating here.

DIRECTIONS FOR THE INSHORE PASSAGE.—From a position about 1 mile eastward of Tandjung Labua make good the course 354° for Pulau Bulunrue between Melambiri and Malamala, the north reef of the latter being marked by a beacon. Sindjai, 886 feet high, is steered for when bearing 297° , passing the beacon on Bunging Keke to starboard and Malilla to port. This course leads to the anchorage off the mouth of the Sungai Tangka.

BETWEEN TANDJUNG ANTJU, UDJUNG SALANGKETO, AND TANDJUNG PATIRO, about 13 miles and 25 miles, respectively, north-northeastward, the coast is edged by a broad drying coastal reef covered with a

layer of mud. BETAH, a rocky islet, lies on the coastal reef off Tandjung Meru, a point lying about $6\frac{1}{2}$ miles northward of Tandjung Antju.

Tandjung Patirol is a protruding rocky point, formed by a small series of hills which rise gradually to about 354 feet and is marked by three trees on the ridge. These trees are visible for a distance of about 10 miles in clear weather.

8C-10 BETWEEN TANDJUNG PATIRO AND TANDJUNG TIPPULUWE, about 11 miles north-northwestward, the coastal appearance changes considerably. Along this part of the coast there are large villages with coconut groves, between which are vast stretches of cultivated land.

There is a roadstead off BADJOA, a town about midway between Tandjung Patirol and Tandjung Tippuluwe. A pier, which dries at low water, is located at the town. The area within the 5-fathom curve, about 3 miles offshore, is thickly studded with coral heads. There is a good road to the chief town of the native state, about 4 miles inland, and the town is connected to the general telephone system. Vessels visit the roadstead regularly.

ANCHORAGE can be taken in $4\frac{1}{2}$ to 5 fathoms, good holding ground, about $2\frac{1}{2}$ miles eastward of the head of the pier at Badjoa.

REEFS—BEACONS.—Amelia, reefs with a least depth of 3 feet, lie about $4\frac{1}{4}$ miles eastward of the head of the pier, and discolor poorly. A black beacon with a cone topmark stands on the northernmost of these reefs.

A reef, which dries, lies about $2\frac{3}{4}$ miles eastward of the head of the pier, and is marked on its northeast extremity by a black beacon with a cone topmark. A 15-foot patch lies about $\frac{1}{2}$ mile eastward of this beacon.

A reef, which dries, lies about $1\frac{1}{4}$ miles eastward of the head of the pier. A black beacon marks its north extremity. Several small reefs lie within 1 mile of the above beacon, two of which are marked by white beacons with ball topmarks.

Torea, a reef which dries, lies about $2\frac{1}{2}$ miles southeastward of Tandjung Tippuluwe. A black beacon with a cone topmark and equipped with reflectors, marks its east extremity.

Totopela, a reef which dries, lies about 2 miles southeastward of Torea and is marked on its west edge by a black beacon with a cone topmark.

DIRECTIONS—SUNGAI TANGKA TO BADJOA.—From the anchorage off Sungai Tanka (sec. 8C-9) the course is 029° , rounding the beacon with a black truncated cone topmark on Boni Boni, a reef southeastward of Tandjung Antju, close to the port hand, care being taken to avoid a $3\frac{1}{2}$ -fathom coral patch about 1 mile southward of Boni Boni, and then steering for Betah until Beloppo, off Tandjung Antju, bears 312° , when course is altered to the northeastward to pass westward of the beacon with a white ball topmark on the northwest side of Tenghai, a reef lying about $5\frac{1}{2}$ miles southward of Udjung Salangketo.

If from southward the stone beacon on Bunging Keke may be left on the starboard hand, steering 359° to pass between the islands eastward of Tandjung Antju and the two beacons with black truncated cone topmarks westward of them. When Betah bears 280° , the course is northeasterly, passing westward of the beacon on Tenghai, as above.

The Twee Gebruders, white sandbanks drying at low water about $3\frac{1}{2}$ miles eastward of Betah, are left close on the port hand, thence close northwestward of the beacon on Tenghai, taking care to avoid a $3\frac{3}{4}$ fathom shoal $3\frac{1}{2}$ miles east-southeastward of Udjung Salangketo. When Tjinnung, 840 feet high, bears 316° , the course is 003° , leaving a reef marked by a beacon with a white ball topmark on the starboard hand, and Dwars in den weg, a reef about $3\frac{3}{4}$ miles southward of Tandjung Patirol and marked by a beacon with a black truncated cone topmark, on the port hand. From abreast Tandjung Patirol the course is 342° , leaving the beacon with a white ball topmark, marking the