There are several unimportant rivulets, but most of the entrances to them are closed during a prolonged drought.

With the exception of a 5½-fathom patch in Krung Raja Bay, and a shoal eastward of Batu Putih, there are no dangers beyond 1,000 yards from the shore. The depths increase quickly between Pedro and Pedir Points.

Anchorage.—Vessels should not anchor in less than 8 fathoms of water; the bottom is chiefly rocky, especially off the headlands.

Tidal currents.—The tidal currents near the shore are regular, but the ebb or west-going tidal current, being in the same direction as the current, is much the stronger of the two.

4–43 **Pedro Point** (5°39' N., 95°26' E.), the northernmost point of Sumatra, is a low headland and may be recognized by the group of casuarina trees growing not far from the beach. The appearance of the coast changes at Pedro Point; westward of it the coast is flat, but eastward it is hilly in places right down to the shore and maintains this character as far as Pedir Point.

The principal stream is the Krung Raja, eastward of Pedro Point. Unimportant villages lies at the mouths of the several streams. Around Krung Raja Bay it is densely populated, but farther eastward it is but sparsely inhabited. The 5-fathom curve is more than 1,000 yards off Pedro Point, but farther eastward, more especially eastward of Ayer Manis River, the 5-fathom curve is steep-to.

Close to the westward of Pedro Point is the entrance to a shallow lagoon, generally marked by surf, and dry at low water.

A patch, with a depth of 2½ fathoms, on the edge of the 3-fathom curve, lies 800 yards off Ladung Creek, southeastward of Pedro Point.

It is reported that very strong swells exist along the entire coast between Pedro Point and Diamond Point. (sec. 4–72)

Mountains.—Gle Durung (Taleue Daroh), 1,037 feet high, is the northernmost hill at Pedro Point.

Gle Gaga (Tulo Po), 1,427 feet high, is the highest of the chain of hills within Pedro Point. These hills have slightly curved, smooth summits and are part of the ridge extending northwestward from Seulawaih Agam.

Seulawaih Agam known also as Golden Mountain, with a cone-shaped peak, 5,938 feet in height, may be sighted at a considerable distance in clear weather.

Seulawaih Inong (Weesberg), 2,930 feet in height, is located about 7 miles eastward of Seulawaih Agam and about 8 miles southwestward of Pedir Point. It is easily recognized by its flattened cone, which has a slight depression in the middle.

4–44 **Krung (Kroeëng) Raja Bay** *(H. O. Charts 3101 and 3121)* lies between Ujong Karoeng, about 1½ miles east-southeastward of Pedro Point and Ujung Batoe Kapal a distance of 4.5 miles, the mouth of the Krung Raja being in the southeastern part of the bay, with Raja village near it; the entrance to the river is dry at low water. The western and southern sides of the bay are marshy, but eastward of the river the coast is a precipitous cliff. Kapal Rock, a high sandstone rock, lies about 400 yards off Ujung Batoe Kapal with a depth of 16 feet in the fairway between. The summit of Kapal is triangular in shape, and has the appearance of a sailing prau when seen from a distance. The shores of the bay

are fringed by a bank extending to the distance of about 400 yards, and there is a patch, with a depth of 4¾ fathoms, lying about 600 yards west-northwestward of Ujung Batoe Kapal. A reef extends about the same distance northwestward from the point.

There are two cliffs near Ujung Batoe Kapal both showing white; these are conspicuous, as they are the only cliffs for a considerable distance.

A coral patch, with a depth of 5½ fathoms steep-to, and 10 fathoms close around, lies in the western approach of Krung Raja Bay, at 1.3 miles offshore, with Kapal Rock bearing 114°, distant 2¼ miles, and with Pulo Buru a little open of Ujong Karoeng. The patch affords good temporary anchorage, and for that purpose should be approached with the latter marks as given; it is steep-to.

4-45 **Anchorages.**—The bay is inconveniently deep for anchorage, and on the western side the bottom is foul, but it is the only anchorage on the northern coast that is usually free from swell in both monsoons. The best position is at the head of the bay, in a depth of 17 fathoms, about 600 yards offshore, with Kapal Rock in range with Ujung Batoe Kapal and the southwest point of Pulo Weh in range with Ujong Karoeng.

There is also good anchorage, in a depth of 6 fathoms, eastward of Kapal Rock, with the south point of that islet in range about 296°, with Pulo Buru.

Tides.—See Chapter 1.

4-46 Coast.—Batu Putih *(H.O. Chart 3121)* lying 10.5 miles eastward of Pedro Point, is formed of chalk and sandstone, falls steeply to the sea, and is easily recognized by a large white patch showing up on green land. At about 1.3 miles eastward of the cliff the 5-fathom curve is nearly 1 mile offshore. Ayer Manis Creek (Kwala Ie Nameh), dry in its mouth at low water, about 1.5 miles eastward of Batu Putih.

Three detached rocks, with a depth of about 2 feet, lie just within the 3-fathom curve off a point with a group of casuarina trees between Blang Raja and Churu, 3.5 miles northwestward of Pedir Point. The 5-fathom curve is steep-to along this coast.

4-47 **VILLAGES.**—Lampanas, or Lam Panaih village, large, and surrounded by coconut trees, is situated on the coast 4.5 miles southeastward of Batu Putih, and there is a long row of trees eastward of it. Ujong Segi (Metale) is a high portion of the coast midway between Batu Putih and Pedir Point, and westward of it is Leungah village, on the west side of entrance to the river of that name.

4-48 **Ujung Blang Raja** may be distinguished by a group of casuarina trees and a small group of houses of which the eastern is located practically on the point. A reef extends from the point, and eastward thereof the bank fringing the coast is somewhat wider. On this bank, within the 3-fathom curve, are three coral reefs, over which there are only 2 feet of water. These reefs are always marked by breakers. The depths beyond the 5-fathom curve are also very irregular. Landing may be effected on the eastern side of Ujung Blang Raja.

Pedir Point, or Ujung Pidie, (5°30'N., 95°53°E.) being the extremity of a range of hills sloping steeply to the sea, is easily recognized; the coral reef fronting it is steep-to, extending 100 yards off it, and at a distance of 1,000 yards the depths are about 18 fathoms. A lagoon at Luang Laweueng village lies within the coast at about 2 miles westward of the point. Laweueng is a fishing village, and is readily identified. There is a small military camp here. Some distance behind Pedir Point there is a very conspicuous tree.

It was reported (1966) that Pedir Point is a good radar target up to 18 miles distant.

Small vessels may round Pedir Point at a short distance if care is taken that the summit of Mount Pedir remains visible above the land in the foreground, in which case the least depth will be 8 fathoms.

4–49 Coast—General remarks.—From Pedir Point to Raja Point, a distance of 38 miles, the coast consists of a narrow strip of sandy coast covered by brushwood, with here and there groups of trees. Small fishing villages are scattered along the coast, and within it the ground is swampy, but not far inland it becomes undulating and is cultivated, fertile, and thickly populated.

Kroeeng Baro is the principal stream on this part of the coast, and between it and Koeala Ndjong from 1,000 yards to 1 mile inland, is a series of thick coconut forests in front of which the land is comparatively bare. Between Koeala Ndjong and Pantai Raja and at Trengading, 3 miles east-southeastward of the latter, the hills approach the coast. Near Pantai Raja and on either side of the mouth of Koeala Ndjong are three groups of high trees.

Ndjong ridge of hills, between Koeala Ndjong and Pantai Raja is bold where it terminates at the coast.

Trengading (Trien Gadeng) Hill, 283 feet high, rises immediately over the beach, and is rendered conspicuous by a single tree on its summit. There are two prominent villages near it.

Within this part of the coast are the Gle Sala, 3,117 feet high, which may be distinguished by a waterfall; the Samalanga, 4,462 feet high, a dome-shaped peak; the Punchek, 5,236 feet high, a flattened cone-shaped peak not easily recognized.

Farther eastward along the coast is Gle Bengalang, 946 feet high, with a fairly flat top with a light-green patch on its northwestern slope.

Eastward of Merdu Point (Ujung Meureudu) the coconut trees again approach the coast until beyond the mouth of Janka Buya Stream, where they merge with the low forest land in which lies Samalanga.

Landmarks are scarce along the coast, but there are no dangers beyond 1,000 yards off it.

Depths offshore.—The shore bank, with less than 3 fathoms of water over it, extends about 670 yards off in places; in others, as between Ayer Lebu and Berachan, and between Samalanga and Raja Point, the shore is steep-to.

4–50 **Kuala Batu** is situated about 4 miles southeastward of Pedir Point. It may be identified, when coming from the eastward, by the fact that the wooded stretch of coast ends at this point. About 1 mile northward of its entrance, and at 1,000 yards offshore, there is a patch with a depth of 2½ fathoms between the 3 and 5 fathom curves.

Kuala Bengalang, 2 miles southeastward of Kuala Batu, has a low-water depth of 3 feet in its rather wide entrance. It has several high trees on its right bank, one standing much higher than the others, and two on its left bank, which render it easily recognizable.

4–51 Segli (Sigli) *(5°23'N., 95°58'E.),* is located at the mouth of a river which flows out about 8½ miles southeastward of Pedir Point. Segli is visible from seaward and some casuarian trees on the beach are conspicuous. There are two entrances to the river, the northwestern of which, dries. The southeast entrance has a depth of about 2 feet and is marked by stakes, but is subject to continuous change in depth and direction. About 2 miles above the entrance, the river is navigable only by canoes.

LIGHT.—A light is shown at Segli.

ANCHORAGE.—There is a good but open anchorage, in depths of from 7 to 11 fathoms, at about 1 mile off the coast and with the fort bearing about 225°. Good anchorage in 7 to 8 fathoms, mud, can be obtained with Seulawaih Inong bearing 282° and almost in line with a conspicuous tree, with Pedir Point bearing 323°, and with the flagstaff at Segli bearing 243°.

The road is bounded to the northwest by a line extending in a northeasterly direction from the road limit mark located about 1,090 yards northwestward of the observation spot, to the southeast by a line extending in a northeasterly direction from the road limit mark located about 1,090 yards southeastward of the observation spot, and within a line perpendicular to the above two lines and at a distance of about 1,090 yards from the coast.

Foul ground, about 1/2 mile northeastward of the flagstaff at Segli, is marked by a small red buoy.

TIDES.—See Chapter 1.

TIDAL CURRENTS.—In the bight between Pedir Point and Gighen, the currents are regular, but weak; the flood running to the eastward and ebb to the westward.

4-52 JETTY.—There is a small wooden jetty, about 45 feet long on the west bank of the river. A 1-ton hand crane is available.

Harbor and port facilities include several launches, some small lighters, and about 15,000 square feet of covered storage.

POPULATION.—The population is estimated at about 7,000.

Supplies of fresh provisions and water in small quantities may be procured.

COMMUNICATION.—There is steamer communication with other ports in Sumatra.

Kuala Gighen (Gigieng), at 3 miles southwestward of Kuala Segi, is insignificant. There is a fishing village on the western side of the entrance. Gighen village is 2 miles upstream. The shore can be approached by the lead, but vessels should not anchor in depths less than 5 fathoms.

4-53 Kuala Lheue, about 1.3 miles southeastward of Kuala Gighen, is the wide mouth of the river of that name. A sand bank just inside makes it appear to be two mouths at low water.

There is deep water close up to the breakers on the bank, so that it is advisable not to anchor in less than 12 fathoms.

Ayer Lebu (Kuala Ie Leubeue) is the mouth of Tiro River, and has a depth of 1 foot in its entrance at low water; it extends for some miles inland and is much used for inland trade by boats. Its mouth may be identified by a few coconut trees a little eastward of it, and a portion of the coast near it appears from the offing as a long, sandy, bare promontory.

ANCHORAGE.—There is anchorage off Ayer Lebu, in from 8 to 10 fathoms of water, but the shore is steep-to eastward of the river.

4-54 Koeala Ndjong the mouth of the Teupin Raja, of some importance to trade, is situated about 4 miles eastward of Ayer Lebu; its entrance has a depth of about 3 feet at low water; it trends westward parallel to the coast within its mouth, and there is a least depth of 4 feet to Ndjong village, situated about 2 miles within the entrance, but near the coast. The left bank of the river is sandy and thickly overgrown with brushwood.

A row of lofty trees is situated near the beach westward of the entrance, and to the eastward a chain of hills, covered by pepper plantations, reaches nearly to the shore.

DEPTHS OFFSHORE.—The bottom seaward of the entrance deepens gradually to 10 or 12 fathoms at 1,000 yards offshore.

Anchorage, in a depth of 8 fathoms may be obtained off the river with the western side of the ridge of hills in range with two trees at the river mouth.

4-55 Supplies.—Small supplies of provisions may be procured at the village.

4–56 Pantai Raja, close eastward of the Ndjong range of hills, dries at low water, and 3 miles southeastward of it is the Trengading, but neither of these streams is of any importance; both dry at low water. Pantai Raja village is about 1 mile up the river of the same name.

Merdu Point (Ujung Meureudu), *(5°16′ N., 96°16′ E.)*, lying 26 miles east-southeastward of Pedir Point, is low and sandy, with a few small trees; a run of water resembling, when at a distance, a path in the valley, is conspicuous during the rainy season. The mud bank marked by breakers, extending from its entrance, was reported (1941) to be extending northward. A grove of trees is situated 1.5 miles to the westward of the point.

The 5-fathom curve is distant about 1 mile from the point.

Merdu River is a small stream, which has a depth of 1 foot on the bar at low water and from 4 to 8 feet inside; its banks are marshy, with mangroves and nipa palms. Eastward of the stream the coast is covered with coconut trees, which continue along the coast to beyond Olim River. The steam tramway passes through Merdu.

4–57 Kuala Olim (Ulim), at about 2 miles eastward of Merdu Point, makes a considerable break in the coconut trees, being 100 yards wide in its entrance, and therefore easily recognized. It usually has two entrance channels, with depths of 4 feet in each at low water, but they are constantly altering; inside, however, there are depths of from 4 to 5 fathoms in places. Olim village, which is small, is situated 1 mile from the mouth. Meunasa Blang village is 4 miles up river.

A stranded wreck lies in the vicinity of the mouth of the Kuala Olim.

Samalanga River has a depth of 1 foot in its entrance at low water, and depths of from 2 to 3 feet, with a breadth of about 50 yards, as far as Samalanga village, 1 mile inside the entrance. It rises in Gle Punchek, and its water is fresh almost down to the mouth. The outlets of the lagoon eastward of Samalanga are dry at low water. Very heavy seas get up off the entrance during the easterly monsoon, rendering anchorage off it untenable.

Anchorage.—The anchorage off Samalanga is in depths of from 12 to 15 fathoms at 1 mile offshore. During the Northeast Monsoon, the anchorage is sometimes untenable.

4–58 Communication.—Steamers visit this port occasionally enroute to other ports in Sumatra. There is telephone communication with Kota Raja.

4–59 Coast—General remarks.—The coast from Raja Point to Krung Kukus River, a distance of 36 miles, is low, sandy, and wooded, with higher land a little within it. Between Pedada and Pasangan Points the low stretch of plain is covered with stretches of grass, interspersed by groves of trees. There is a row of lofty trees on either side of Krung Kukus River, giving the land the appearance of a promontory; the marshy land traversed by lagoons which lie within the shore is only a narrow strip.

There are many villages along the coast, giving it a prosperous appearance, but good landmarks are scarce; the promontories are all low and not so sharply defined as those westward of Raja Point.

Between Pasangan Point and nearly to Krung Kukus the coast bank extends nearly 1,000 yards off, but from the latter, for some miles eastward, the coast is steep-to and should not be approached within a depth of 10 fathoms; the bottom is chiefly hard sand and small stones, with coral in places, and the holding ground is indifferent.

4–60 Mountains.—Gle Pedada (Ran) *(5°09′ N., 96°35′ E.)*, 1,280 feet high, and located about 9.5 miles southeastward of Raja Point has a large rounded summit, sloping gradually on the west side, but somewhat more steeply on the east side.

Gle Goh, or Elephant Mountain, 3,072 feet high, and located about 6.5 miles southward of Gle Pedada, resembles an elephant with its heads to the westward.

Gle Pasangan (Mongmong), 741 feet high, and located about 10.5 miles eastward of Gle Pedada, has a thicket on its summit with two trees rising from it.

Gunung Chunda (Geureudong) is a ring-shaped mountain range of which the northern part has crumbled away. The ends of the part which is still standing, being located closest to the coast, appear higher than the rest of the range; therefore they give the appearance of being two peaks of the same mountain range, which, however, is really not the case. The range attains a height of 9,426 feet at its western end. This range is visible along the entire north coast of Sumatra from Gigieng Road to Jambo Ayer.

Pasai Range, to the eastward, attains a height of 6,313 feet, but has no conspicuous summit. There are no ranges between this and Jambu Ayer, 25 miles to the northeastward.

About 14 miles southeastward of the Pasai is Gunung Tumian, the summit of which is 3,589 feet high.

4–61 **Point Raja** (5°15' N., 96°29' E.) a low promontory, may be recognized at some distance by a grove of high trees near its extremity; there is a depth of 5 fathoms near it, but it should not be approached to a less depth than 8 fathoms or within the distance of 1,000 yards. Red Rocks, so named on account of their color, lie 1 mile southeastward of Raja Point.

It was reported (1966) that Point Raja is a good radar target up to 21 miles distant.

Patch.—At 2.5 miles east of Raja Point a coral patch, of small extent, with a depth of 4¾ fathoms and steep-to, lies 2 miles offshore, with Gle Bengalang bearing 225°, distant 5.8 miles.

A rock, awash at low water, lies 1.3 miles southeastward of Raja Point, at about 600 yards off the Red Rocks, with shallow water seaward of it; the 5-fathom curve passes about 1 mile offshore between Raja and Pedada Points.

Pedada Point, 6.5 miles eastward, and the eastern extremity of the bay between, is low and not easily recognized from the offing; a patch of jungle marks it. The water deepens suddenly outside the 5-fathom curve. Pedada Stream, the mouth of which is a mile eastward of the point, is navigable for boats, and the village lies on its right bank near the coast.

4-62 **JEMPA VILLAGE** is situated about 4 miles eastward of Pedada Point; the village and its stream are of no importance.

4–63 Northward of Jempa the 5-fathom line passes about 1 mile from the shore; within that line the depths are irregular.

Gle Bengalang, well open of Pedada Point, bearing 250°, leads seaward of this bank.

The Kuala Raja, about 9 miles eastward of Pedada Point, has a low-water depth of 3 feet on the bar and 6 to 8 feet inside; a bank on which the sea breaks extends a short distance northeastward of the mouth, and a village, conspicuous from seaward, stands on the left bank of the river. The shore here is low and sandy, and the 5-fathom curve is 1,000 yards off.

4–64 **Pasangan (Peusangan) Point,** situated 22 miles eastward of Raja Point, is low and sandy, and may be recognized by several dwarfed casuarina trees on it. The 5-fathom curve is 600 yards off, beyond which the water deepens rapidly to 30 fathoms at 1 mile distant.

Kuala Cheurape is the mouth of Krung Pasangan (Peusangan). The lower reach of this river is called Krung Blang Me.

Anchorage can be taken in 6 fathoms off Kuala Cheurape, but there are dangerous sandbanks located here.

Kuala Mane is the mouth of Krung Sawang. It lies about 5 miles east-southeastward of Pasangan Point.

Rocks.—Cape Agam Agam is a very slight projection of the coast 8 miles eastward of Pasangan Point, nearly 1,500 yards off which the Agam Agam, two reefs, with 6 feet of water over them, lie just within the 5-fathom curve; they are steep-to on their seaward side. Gle Pasangan, bearing 236°, leads northwestward of them.

Anchorage.—In the bight between Pasangan Point and Agam Agam good anchorage may be obtained in 5 to 7 fathoms.

4–65 Krung Kukus (Kuala Lanchang).—The mouth of the river of that name is easily recognized by the group of dark casuarina trees standing on either side of it. It is of some importance, has a low-water depth of 2 feet, and there is about the same depth to a village 1 mile up. Above this the depths are from 2 to 3 fathoms, and on the left bank are sand hills about 24 feet high, while the opposite bank is covered with thick brushwood and in some places dense jungle.

Shallow passages lead through the lagoons to Bungkas River (Kuala Geukueh) to the westward and Teluk Semawe to the eastward from abreast the village. The mouth of the Bungkas dries at low water, and may be identified by groups of dark-colored casuarina trees standing on either side of it. From a distance this appears as a headland.

Anchorage.—Good anchorage may be obtained, in 10 fathoms, abreast or a little eastward of the mouth of Krung Kukus.

4–66 Coast—General remarks.—From Krung Kukus to Jambu Ayer, a distance of 27 miles, the coast forms a deep bight, the western part of which is known as Teluk Semawe. The shore is sandy, backed by a narrow strip of swampy forest land, within which, at about 1 mile distant, it becomes hilly. The hilly range, which trends southeastward, begins at Mamplam Hill, 4 miles northwestward of Teluk Semawe, which hill is rendered conspicuous by a solitary tree on its summit. Eastward of Shunda the hills recede from the coast in a southeast direction, and the extensive plain begins, which is widest at Jambu Ayer and extends all along the eastern coast of Sumatra. The Pasai, Kertei, and Jambu Streams, which, with their tributaries, irrigate a wide tract of land, enter the sea on this coast. Several groups of trees near the coast offer good landmarks, as charted.

Caution.—Numerous bamboo poles, secured by long lengths of rope, used for marking fish pots, may be encountered within 3 miles of the shore between Teluk Semawe and Jambu Ayer Point.

4–67 Semawe Island, about 4 miles in length by 1 mile in breadth, is marshy and unproductive. It closely adjoins the mainland, being separated by Kuala Mamplam. Its eastern side is steep-to.

Kuala Mamplam.—Its western entrance, located about 4½ miles eastward of the Krung Kukus, has a depth of 1 foot at low water, with depths of 2 fathoms in places inside. Its banks are swampy, with villages here and there, among which are those of the chiefs of Semawe and Chunda. Kuala Mamplam communicates with the Krung Kukus by swampy and shallow passages, available only for canoes, and also with Teluk Semawe.

Agu (Barat Laut), the northeastern extremity of Semawe Island, is a sandy promontory easily recognized by the high trees just within it. The point is steep-to, with depths of from 15 to 20 fathoms at a short distance.

Dangers.—The shore between Krung Kukus and Teluk Semawe is steep-to, there being a depth of 10 fathoms a short distance from it, but thence eastward to Jambu Ayer a sandbank fronts the shore, and the 3-fathom curve, generally about 1 mile off, is, when to the northward of Tjangkoj and northwestward of Jambu Ayer, from 2 to 2½ miles from the coast and has on it several shallow coral patches. Patches also lie outside the 10-fathom curve.

Gatui, with a depth of 2 fathoms, lies 2½ miles northwestward of Tjangkoj; northward of Tjangkoj, the coast bank, with depths of less than 3 fathoms, extends to the same distance from the shore.

Tenga Reef, a coral reef with a depth of 4 fathoms, and from 12 to 14 fathoms around, lies 5 miles offshore, with Jambu Ayer Lighthouse bearing 100°, distant 7 1/3 miles. It is always advisable to give this reef a wide berth.

Minyak, a patch of 9 fathoms, with 18 to 23 fathoms close-to, lies 2 miles northwestward of Tenga.

The bottom near the shore is sand and a short distance off it is sand mixed with mud and coral, while in the offing it is clay and mud. Under favorable circumstances the last two dangers are marked by tide rips.

Timau Reef, awash at low water, is surrounded by depths of from 7 to 8 fathoms, and lies about midway and a little eastward of a line joining Tenga Reef and the solitary tree on the shore.

It has been reported (1943) that there are no discolorations of the water at any of the above-mentioned reefs.

4–68 **Teluk Semawe (Lhokseumawe)** *(H. O. Chart 3121)*, the bay between Semawe Island and Kertei River, is 7 miles wide, and fronted by a bank with less than 3 fathoms of water to about a mile offshore. Teluk Semawe may easily be recognized by the hills, a remarkable ridge, 500 feet high, at about 2 miles west of Chuda village. These hills are cleared of trees, and the light-green grass renders them distinguishable. Lho Seumawe (town) is a good radar target up to 15 miles distant.

Lights.—A light is shown about 2/3 mile southeastward of Agu, the northeast extremity of Semawe Island.

A light is shown on the end of the pier at Lho Semawe.

Wrecks.—A sunken wreck lies about 1 mile eastward and a stranded wreck lies about 2/3 mile south-southeastward of the head of the pier at Lho Semawe.

Anchorage.—Excepting Raja River this is the only anchorage on the northern coast of Sumatra affording protection from the open sea. It is well sheltered during the southwest monsoon, but is not roomy, and the depths increase rapidly offshore. At times during the northeast monsoon fresh breezes against the tide cause a nasty sea to vessels at anchor in the road. There is anchorage in 7 fathoms with the pier at Semawe Town bearing 285° about 400 yards distant, and farther eastward at 2 miles northward of the Kertei trees, in about 6 fathoms.

Vessels from the eastward should approach it from northward of Tenga Reef.

4–69 SEMAWE TOWN, a military station on the southeast extremity of Semawe Island, the capital of the north division of Acheh, and the residence of a controller, is an important port for the inland trade. It is important because of the good boat harbor in the south entrance to Kuala Mamplam and the inland communication by that creek to Krung Kukus, thus avoiding the sea passage to that river during the northeasterly monsoon period, when it is dangerous for very small craft. The entrance to the river or creek has a depth of 3 feet on its bar at low water.

Pier.—There is a pier on the southeast side of Semawe Island, but loading and discharging is difficult here at times. A crane is located at the head of the pier.

Supplies.—Fresh provisions and water may be obtained at Semawe.

Communication.—Regular steamer communication is maintained with other ports and there is a station.

4–70 **Coast.—Kuala Meraksa (Meurasa)** enters Teluk Semawe and has a least depth of 2 feet on its bar, with from 1 to 2 fathoms within for some distance. The village of same name lies on the right bank, near its mouth, and that of Baju about 2 miles up.

Pasai (Pase) River lies 4 miles eastward of the Meraksa, and has a least depth of 2 feet in its entrance. Its mouth is distinguished by two trees. Gedong village, a station of the tramway service, is located about 2 miles upstream; craft of 3 feet draft can reach there, but the channel is tortuous.

Kertei (Keureutu) River, about 7½ miles eastward of Semawe, is a rapid fresh-water stream rising far inland, and its mouth, 150 yards in width, is easily recognized by two lofty trees rising conspicuously above the brushwood. Here the banks are low and covered with brushwood, and there are some villages.

Farther up the banks are higher. At Belang Puoi (Keureutse), on the right bank, about 4 miles up, they are from 5 to 6 feet above high water, and for a distance of 7 miles the width of the river is not less than 100 yards. The country in the vicinity is thickly populated and the land under cultivation. The bar of the river has a low-water depth of 2 feet and with the exception of a bar with 6 feet abreast Lapang (Blang Nibong), a little above the entrance, the depths are from 2 to 5 fathoms. Craft of 6 feet draft can enter.

Kuala Tjangkoj (Changkoj), about 3 miles east-northeastward of the Kertei River, is marked by trees.

4–71 **Pidada (Piadah) River,** nearly 4 miles eastward of the Kertei, has also a low-water depth of 2 feet in its entrance, and may be recognized by a conspicuous grove of trees close to it. There are depths of from 3 to 4 fathoms in the river, between banks of mangroves.

Jambu Ayer (Aye) River takes its rise at a considerable distance in the interior, enters the sea at about 1 mile westward of the point of the same name, and separates the Province of Kertei from that of Simpang Olim. It is about 100 yards wide in its entrance, with a low-water depth of 3 feet, but the bar is usually breaking at that time; it is subject to change. Steamers of 4 and 5 feet draft can ascend for about 16 miles; it is not, however, easily navigated, as there is always a strong downward current, with many snags in the rainy season, and the channel is tortuous. Discolored water from the river sometimes extends for a distance of 4 miles from the mouth.

The banks of the lower portion of the river are low and swampy, and overgrown with mangroves; above they gradually grow higher, and the vegetation becomes more luxuriant, with many villages, pepper gardens, etc. Above Baba Lung, about 20 miles up, the banks are about 25 feet above the river, and overgrown with bushes.

The river is not much used by the natives for trade purposes, owing chiefly to its shifting and dangerous bar. Produce is generally taken through an artificial canal to the Simpang Olim for shipment.

4–72 Jambu Ayer (Aye) (Diamond Point) is a sandy point just above high water, within which are a few casaurina trees. The coastline appears to be receding. A deteriorated light structure stands in the water about 1 1/4 miles northwestward of the point. Jambu Ayer is a good radar target at 20 miles distant.

Spit.—A spit, with depths under 3 fathoms extends from the point to about 1½ miles northwestward of the light; it is somewhat steep-to on its east side, over which the sea breaks in places. The 5-fathom curve is about 2 1/3 miles northwestward of the light; discolored water has been reported about the same distance northward of it, probably caused by detritus from the river, but vessels should not approach the spit to a less depth than 10 fathoms, especially during the northeast monsoon, when a heavy swell will be experienced.

Tides.—The mean high water interval at Diamond Point is 11h. 50m., mean range 6½ feet, spring range 8¾ feet.

Tidal currents.—The flood current sets southeast and the ebb northwestward, but between Jambu Ayer and the Aroa Islands the set varies a point or two, according to the direction of the coast.

The ebb, being increased by the prevailing northwesterly current, is stronger and of longer duration than the flood, and at springs sometimes attains a rate of 3 knots, but when the distance from the shore is considerable it seldom exceeds 1½ knots.

Near the coast westward of Jambu Ayer the tidal currents are weak.

4–73 General directions.—The north coast of Sumatra can almost everywhere be approached to a depth of 12 fathoms, since all dangers lie within that limit. The only exceptions are the dangers westward of Jambu Ayer and the 5½-fathom patch in Krung Raja Bay.

For winds and currents, see chapter 1.

CHAPTER 5

MALACCA STRAIT, WESTERN SHORE—JAMBU AYER TO THE KARIMON ISLANDS, IN THE WESTERN APPROACH TO SINGAPORE STRAIT

5–1 General remarks.—Abreast Jambu Ayer on Diamond Point, described at the end of Chapter 4, Malacca Strait is reduced to a breadth of about 165 miles between that point and Pulo Penang, tapering within to the southeastward. Pulo Perak, 394 feet high, lies in the fairway between, at about 20 miles northward of a line joining them and makes a good landfall.

East coast of Sumatra (H.O. Chart 3120)

Aspect.—The land between Jambu Ayer and Ujung Tamiang presents from the offing one uniform stretch of high woodland with scarcely any perceptible interruptions. Inland is a chain of mountains trending south-southeastward, a continuation of the chain in the northernmost part of Acheh. From February to May, inclusive the high mountains are faintly visible, but during the rest of the year they can usually be seen, especially in the morning.

Gunung Tumian, or Temin of Semuang *(4°44′ N., 97°23′ E.)*, 3,589 feet high, is the northernmost portion which can be distinguished; it lies about 25 miles from the coast and is only visible in clear weather, but its rounded tops render it useless as a mark.

To the south of Langsar Bay a spur of this range comes within 6 miles of the coast with two recognizable summits, namely Tamiang, 394 feet, and Flat Hill, 509 feet. Near Edi Rajut and Pedowa, to the northward also, the hills approach the coast.

Pedowa Hills *(4°53′ N., 97°48′ E.)* are situated near the parallel of Perlak; they are low and rounded hills, and the highest is distinguished by a leafless tree on its western declivity.

Kuala Edi Rajut can be distinguished by the masts of the many small vessels usually lying there, and possibly by the Pedowa Hills, 7 miles to the southeastward.

A waterfall appearing as a light streak on the mountain side, at a height of 2,887 feet, is visible off and southward of Langsar.

The land within the sandy strip of shore is mostly low and swampy and covered with mangroves; at the mouths of the streams there is generally more sand, and these spots are marked by casuarina trees.

A sand and mud bank, with depths of from 1 to 3 fathoms of water over it, fronts the shore to a considerable distance in places; beyond it the bottom is mud, or sand and mud. There are no detached dangers along this stretch of the coast.

5–2 Rivers.—A number of streams or small rivers flow through the coastal lands, each bearing the name of the district through which it passes. The river water which flows out to sea can always be distinguished by its great difference in color.

The principal are the Simpang Olim, the Arakun Dur, Edi Rajut, the Perlak, Langsar, and Tamiang, and there are several creeks intersecting the swamps; many of them dry at their entrances at low water, and are subject to considerable change. Local knowledge is required for entering these streams.

Owing to the nature of the land the country is thinly populated; the inhabitants are mostly fishermen, and their villages are usually at the mouths of the several streams and not conspicuous from the offing.

Tides.—The double daily springs occur along this coast at about two days after full and new moon, with high water at noon, and a rise of about 5 feet. Neaps occur two days after the moon's quadrature, with high water at 6 hours and a rise of 1½ feet.

Single daily high water occurs on January 1 at 7 hours p. m., and on April 1 at 1 hour p. m., July 1 at 7 hours a. m., October 1 at 1 hour a. m.; springs occur at moon's greatest declination, with a rise of 1½ feet; neaps occur when declination is nil, with a rise of 6 inches. The highest water levels occur in mid-April and mid-October at noon and midnight, respectively. The currents in the offing are largely affected by the wind, but the set northwestward is the prevailing one. Nearer the shore the flood or rising tide sets southeastward and the ebb northwestward at a rate of about 1¾ knots and near the shore at about 2 knots; in the mouths of the rivers the current is at times about 3 knots, but depending on the width of the entrances.

Winds.—Regular land and sea, breezes are experienced on this part of the coast in February, March, and April, the latter portion of the northeast monsoon.

5–3 Coast—Pari Busuk (Pari Buso) and Ringin (H.O. Chart 3120)—Between 3 and 6 miles southeastward of Jambu Ayer are lofty casuarina and other trees situated within the edge of the mud bank and separated by a shallow lagoon from the coast; these are very conspicuous.

The 10-fathom curve passing about a mile eastward of the islands is fairly steep-to.

Rusa Creek *(5°12′ N., 97°32′ E.)* debouching 6.5 miles from Diamond Point, communicates with Jambu Ayer River at Babalung village, up to which it is navigable for craft of 4 feet draft. The banks are swampy near its mouth, but farther up there are scattered villages on higher cultivated ground.

Belas Creek, southward of and communicating with Rusa, is navigable for craft of 4 feet draft. It also communicates with Jambu Ayer River.

A patch with a depth of 5 fathoms, just within the 10-fathom curve, lies 1.8 miles northeastward of Belas Creek.

5–4 Simpang Olim River, situated 9 miles southeastward of Jambu Ayer, is one of the deepest on this coast. It has a depth of 10 feet on its bar at high-water spring tides and from 2 to 4 fathoms within as far as Rusa Branch, and the banks are swampy, with many creeks discharging through them. The village of Simpang Olim is situated on higher ground about 6 miles above the entrance. The channel over the bar is marked by stakes and is subject to considerable change.

The bank fronting Rusa, Belas, and Simpang Olim, with less than 3 fathoms, extends from 1 mile to 1.8 miles offshore.

Tides.—Springs rise about 6 feet.

Steile Point, 2 miles southeastward of Simpang Olim, is a low sandy tongue, with a thick casuarina wood, which from the offing appears like a steep headline; hence its name. It may be approached by the lead.

In 1961, it was reported that the coastline in the vicinity of this point was extending seawards.

Arakundoe River, 1.5 miles southeastward of the Malihan, is. for small craft, one of the most important on this coast, being broad, straight, and easy to navigate. There is a depth of 10 feet on its bar at high-water spring tides, close along the northern point

of entrance, and ample room within for vessels that can enter, there being from 2 to 6 fathoms of water for some distance.

Vessels of 6 feet draft can ascend to Arasan Belu Island, just above which there is a bar with a low-water depth of 6 feet. Boats can reach Semantoh; some distance above this it connects with the Jambu Ayer.

The banks of the river are swampy nearly up to Telok Sintang village, where there is a small supply of good well water. Above this the ground becomes higher and the wooded land is interspersed with pepper plantations. At Teping Kuleh, just above Sintang, there is a fresh-water stream.

Tides.—Springs rise 6 feet.

5–5 **Juluk (Julo Rajeu) River,** 2 miles southward of Arakundoe River, has a depth of about 10 feet at high-water spring tides on its bar; craft of 5 feet draft can ascend to Rantu Panjang village, above which it is narrow; it is no great distance beyond to Juluk Besar village. Its entrance is said to be marked by stakes.

Glumpang village, surrounded by coconut trees, lies within the entrance with a swamp behind it.

The Buging, Bagah, and Edi Chut Rivers to the southeastward are dry at low water and of no importance. The ground near them is all swampy.

Edi Rayut (Idi) River is winding and from 20 to 30 yards in breadth, with a depth of about 1½ feet on its bar at low-water spring tides, but it is subject to change; the channel is marked by stakes; and small trading craft ascend to Edi village, about 3 miles up. The customhouse is on the right bank at the mouth, from whence there is a good bridle path to Edi, and there is a fishing village on the left bank.

Shoal.—A shoal with a least depth of 4¾ fathoms lies 5 miles 350° from Edi River Entrance.

Anchorage.—Anchorage may be obtained off the river in 5 fathoms of water, with the customhouse bearing 236°. distant 1.5 miles, but it is exposed during the northeast monsoons, and communication with the shore is at times impracticable. There is anchorage in 4 fathoms, with the mouth of the river bearing 224° and Steile Point 312°. The masts of the small craft in the river serve to identify it from the offing. There is also a pair of oblong hills of a yellowish color close over the coast, rising above the trees and above the tree of Edi, which stands on a fairly high hill in the neighborhood. It must not be confused with a similar tree in the Jingki district to the southward.

Tides.—Springs rise about 6 feet.

5–6 **EDI (IDI)** is one of the most important places on the eastern coast of Acheh, and is the residence of the Administrator of the subdivision of Edi.

Supplies.—Small supplies are obtainable, but water is scarce.

Communication.—There is communication by steamer to other ports in Sumatra and to Singapore. The village is on the main railway line of the east coast.

5–7 **Pedowa (Peudawa) Kechil and Pedowa (Peudawa) Besar** are two shallow streams navigable by boats only to the villages of like names on their banks.

Ujung Perlak (Peureula) (4°53'N., 97°54'E.) (H.O. Chart 3120), situated about 33 miles southeastward of Jambu Ayer, is a low and sandy point covered with tall trees, which, with the Pedowa Hills 4 miles within, render it easy of recognition.

It was reported (1966) that Ujung Perlak is a good radar target up to 16 miles distant.

Perlak (Peureula) Bank, with depths under 3 fathoms, extends 1¾ miles eastward and 4 miles northward of the point. Spots on it are dry and others nearly so at low water, and the sea nearly always breaks over it. The bank may be approached by the lead.

Perlak (Peureula) River is approached over Perlak Bank, and has a shallow entrance, but inside it is about 50 yards in

breadth with a depth of 2 fathoms. The somewhat large village of Perlak (Peureula) is situated about 10 miles upstream. The river banks in its lower portion are marshy, and the first fishing village is about 2 miles up. Above Perlak the ground is higher, and there are pepper gardens and other plantations.

Anchorage.—Owing to Perlak Bank, vessels must necessarily anchor at some distance from the river, the nearest spot being abreast Ujung Perlak.

5–8 Coast—Aspect.—The coast between Ujung Perlak and Ujung Tamiang, a distance of 37 miles, is uniformly low, covered with tolerably high trees, and intersected by many unimportant creeks; about midway is Langsar Bay. A strip of sand fronts it for the whole distance, with mangroves growing in the morass behind it, and here and there are shallow lagoons between the morass and the sand; with the exception of a few fishing stations the coast is almost uninhabited.

The sandy shore is conspicuous from the offing in places, namely at Perlak, the mouth of Jingki River; Ujung Langsar, and between the Telaga Muku and Yu (Iju) Creeks; between the last-mentioned creeks there is a long row of casuarina trees, and also fronting the lagoon southward of the mouth of Jingki Creek.

The coast is fronted by a mud bank, with less than 3 fathoms of water over it, at distances of from 1 to 2 miles offshore, and abreast Perolin Island to nearly 4 miles off; it may be approached by the lead in most places, but off Perolin Island, in Langsar Bay, and between Pantei Kerma Creek and Tamiang it is steep-to, dropping quickly to 10 fathoms.

5–9 Landmarks.—The principal landmark in clear weather off this coast is the waterfall referred to in section 5-1. It is about 25 miles within Langsar Bay. Flat Hill, (Platte Heuvel), 508 feet high, 12 miles southwest of Ujung Tamiang, is also a useful mark. Gunung Langsar, 4,692 feet high, 35 miles within Langsar Bay, is a good mark in clear weather, as well as the higher mountain tops charted southward of it. A conspicuous clump of trees stands on the eastern side of Perolin Island.

Boga Creek, about 2.5 miles southward of Ujung Perlak, was formerly of importance as being a short route to Perlak settlement, but it has so silted up as to be only available for canoes.

Lagot (Leugo Rajeu), 8 miles southward of Ujung Perlak, has a depth of 6 feet at its entrance at low water and is a good boat passage to Perlak settlement.

Jinglei (Jeungki) River is only available for boats; its banks are marshy and intersected by smaller creeks; about 6 miles up is the village of Krut Renchong, at the fork of two streams, above which the land is less swampy and cultivated. There is a fishing village at the mouth of Jinglei River.

Raya River (S. Raja) the mouth of which is marked by a cluster of trees with red foliage, is available for boats. There is a fishing village on the coast, and 5 miles up is the village of Baru. Raya village, through which the coast tramway passes, is about 8 miles from the entrance.

Bayan (Bayuen) (Sungi Bajeuen), approaches from the northward between Perolin Island and the main island, is navigable by its northern entrance for vessels of 7 feet draft, and depths of from 3 to 6 fathoms are found within the bar for some distance. Its banks are swampy and intersected by numerous creeks. At Randau Panjang village, about 10 miles from the entrance, the river divides, the northern branch leading to Simpang Anas and the western to Bayan, the residence of the controller. The entrance south of Perolin is very shallow.

Caution.—Depths of about 1 fathom less than charted exist in the channel at the mouth of the Bayan.

Buoy.—A white conical buoy, moored about 1¼ miles north-northwestward of the northern extremity of Perolin Island, marks the western side of the entrance channel within the bar.

5–10 Perolin Island, about 2½ miles in length by 1 mile in width, is low, sandy, covered with casuarina trees, and easily recognized. Mud flats extend 3½ miles eastward of it, with a 1-fathom patch at the northeastern extremity at the edge of the 3-fathom curve.

Ujung Langsar (Tanjong Langsa), abreast Perolin, on the opposite side of Langsar Bay, is rendered conspicuous by its sandy beach and cluster of casuarina trees. There is also a forked tree higher than the rest over the point. There is good landing in front of the village; mud flats extend eastward of it, as charted.

5–11 Langsar Bay (Langsa Bay) between Perolin Island and Ujung Langsar, is 4½ miles wide and contains numerous shoals, between which there are narrow boat channels leading to the various streams that discharge into it. The bay is easily identified by the rising ground behind, against which Telaga Tuju Island—on the northern side of which there are two trees—stands out sharply. Langsar Settlement, located at the southeast part of the bay, is very conspicuous when seen from the eastward. Perolin Island, with a conspicuous clump of trees on its east side, is a good landmark for vessels approaching from the northward.

Near Ujung Langsar, which has a few native houses, lies Telaga Tuju Island (Telaga Toedjoh), the outer island, with a buoyed channel to the river on the western side of it. Telaga Tuju Island is about a mile in extent, covered with trees, and can be distinguished from the main island when coming from the southeastward; mud flats, with depths under 3 fathoms, extend 2 miles seaward of it.

Fairway Buoy, 4 miles eastward of Perolin Island, marks the entrance of the channel leading to the mouth of the Langsar River. This buoy is painted in red and white vertical stripes, and shows a light.

A black conical light buoy is moored about 2½ miles southeast by east of Perolin Island.

A conical buoy, painted in red and white checkers, surmounted by a red cylinder, is moored 3 miles east-southeastward of Perolin Island.

Langsar Channel (Telok Dalam) is marked by lighted and unlighted buoys.

There is a least depth of 10 feet at low-water springs in the channel.

Tides.—It is high water, full and change, in Langsar Bay, at 11 hours 30 minutes; springs rise from 6 to 7 feet.

Tidal currents.—The tidal currents run with considerable strength in the mouths of the rivers and at times are strong even beyond the 5-fathom curve.

5–12 Pulo Rawan (Rawah Rajeu), covered with mangroves, is difficult to identify from the offing as the trees with which it is covered merge with those on the Sumatra coast. A conspicuous tree stands on the north tip of Pulo Rawan. Pulo Rawan Chut, also covered with mangroves, is located in the channel westward of Pulo Rawan. The above-mentioned channel is only navigable by sloops. Pulo Tikus (Tikoih), covered with mangroves and well defined at a considerable distance, is located westward of the tongue of land westward of Rawan. A bank, which dries in places, extends 1 mile northward from the above-mentioned tongue of land.

5–13 Langsar River.—The entrances to Langsar River lie on either side of Telaga Tuju Island, connecting at its south end, thence passing southward of Rawan Island.

The banks are low and marshy for 14 miles, as far as at Langsar. Above this the land is higher, with many plantations. Small craft going up have to be careful of snags, and the strength of the stream is considerable.

Langsar Channel (Telok Dalam).—The north entrance has a depth of 10 feet on the outer bar and 10 feet on the inner bar at low water, spring tides, but it is tortuous. The channel is **buoyed.**

The east channel, Kuala Langsar, southward of Telaga Tuju Island was reported (1958) to have a least depth of 2 feet on the bar in the approach.

5–14 Kuala Langsar, is the port of the town of Langsar which is located further up the river.

Pier.—There is a pier about 225 feet long with a depth alongside of about 20 feet. In 1950 it was reported dilapidated.

Supplies.—Provisions can be obtained from the town of Langsar.

Communication.—There is regular steamer communication with other ports in Sumatra. Kuala Langsar is connected by steam tramway with Langsar, which is on the main railway line of the east coast.

5–15 **Birim River** is located westward of Kuala Langsar; the approach, known as Birim Channel, has a general depth of from 19 to 21 feet, and over the bar there is a passage with a least depth of from 9 to 10 feet. Within the river and abreast the east point of the entrance, there is a depth of 6½ fathoms.

Majapahit (Manja Pajetor Raja Tua) River, eastward of Langsar River, has a least depth of 6 feet, is 450 yards wide in the entrance, and deep within, but the mud flat extending from Ujung Langsar fronts it to the distance of 2 miles. The village of same name is 11 miles up. There is a fishing village on the eastern point of the entrance near some casuarina trees.

5–16 **Coast.—Pulo Rukui** *(4°31′ N., 98°08′ E.)*, about 4 miles eastward of Ujung Langsar, is only an island at near high water, at which time there is a passage within it for canoes only. The tall casuarina trees on the eastern side of Rukui Stream are conspicuous; the mouth of the stream dries at low water. The Raja Muda, between Rukui and the Majapahit, northwestward of it, has a least depth of 3 feet.

Telaga Muku River, about 11 miles southeastward of Ujung Langsar, is about 1 mile wide at its entrance; its channel is dry in places at low water. A large casuarina tree stands on the eastern side of the mouth.

Yu (Iju) River lies between Telaga Muku River and Ujung Tamiang, and on the coast between there is a sandy beach with a long row of casuarina trees. The estuary of this river is about 1½ miles broad, but nearly blocked by flats dry at low water; the channel is on the western side and has a depth of 3½ feet at low-water spring tides. Vessels of 6 feet draft can ascend nearly to Yu village. Near its mouth is a passage to the Tamiang River with a least depth of 10 feet and a least breadth of 20 yards.

This part of the coast should not be approached to a depth less than 11 fathoms.

Tides.—Springs rise about 7 feet.

5–17 **Directions.**—The channel is subject to changes and local knowledge is necessary for entering the river. Care must be taken when approaching from northwestward or southeastward, as the coastal bank is steep-to for about 8 miles northwestward of Ujung Tamiang and for 3 miles southward of it.

Ujung (Oejang) Tamiang *(4°25′ N., 98°17′ E).*—This projecting point may be readily identified from all directions by the groups of casuarina trees located on either side of

the mouth of the Tamiang River, and which are visible from a considerable distance. A flat fronts the point to the distance of about 1 mile in places not covered at high water. It is steep-to, with a depth of 20 fathoms within a short distance. At a great distance from the northwestward or southeastward this point resembles an islet.

It was reported(1965)that Ujung Tamiang is a good radar target up to 20 miles distant.

A bank of small extent, on which the least water found was 13 fathoms, lies 065°, distant 4.8 miles from Ujung Tamiang. There are depths of 20 fathoms around.

Anchorage may be obtained to the eastward of Ujung Tamiang in from 10 to 12 fathoms of water.

5–18 **Tamiang River.**—Tamiang River, formed by the junction of the two streams, Simpang Kanan and Simpang Kiri, is sinuous. Its breadth varies from about 120 yards at its mouth to 70 yards at the first village. Considerable depths are found in the river, which is navigable, although difficult for vessels of 6 feet draft, as far as Semantoh Point, above Seruwai, which is 10 miles from its mouth, and even higher up.

Kuala Besar, the main outlet of this river, lies close westward of Ujung Tamiang, and is about 120 yards broad. Its channel to the sea is close round the point, and between it and the mangrove-covered sandbank westward of it, which portion of the channel is sometimes dry at low water. Northeast of the mouth is a sand-cay covered with mangroves, steep-to on its northeast and eastern sides.

Westward of the Kuala Besar is a delta branch of the Tamiang known as the Kuala Penaga, with a depth of 1 foot at low water, and unofficially beaconed. It discharges into the eastern portion of the Yu River, previously mentioned.

The passage from the Yu River and its connection with the Tamiang River affords deeper water, 10 feet, as mentioned above.

WRECKS.—Two wrecks with swept depths of 8 1/2 fathoms over them lie respectively about 3/4 mile east-northeastward and about 2 3/4 miles northwestward of Ujang Tamiang.

Tides.—It is high water, full and change, off Ujung Tamiang at 12 hours 30 minutes; springs rise about 7 feet; the tide rises 2 feet at the town. The flood current is scarcely noticeable at times in the river.

5-19 **SERUWAI**, the chief town of the district of Tamiang and a military post, is situated about 10 miles up the river. Kampong Simpang lies at the confluence of the Simpang Kanan and Simpang Kalui Kiri and can be reached by a small steam craft on an ordinary river level. There is a good road to Aru Bay.

Communication.—A small steamer maintains communications with Deli River, etc.

5–20 **Coast—General remarks.**—The portion of the coast of Sumatra between Ujungs Tamiang and Tanjung, about 97 miles to the southeastward, is low, thickly covered with vegetation, and consists entirely of an alluvial formation intersected by numerous small rivers, few of which are navigable even for small craft.

The shore is composed of mud overgrown with mangrove trees, here and there intercepted by strips of sandy beach, on which casuarina trees are almost always to be found. These are markedly distinguishable from the mangrove owing to their darker color, greater height, and their fine needle-like foliage. Many of them may be seen from a distance of 20 miles in clear weather.

Where the mangrove grows the ground is inundated, and the mangroves extend back many hundreds of yards. Within them the ground is marshy in places, but mostly the land is firm, with tall trees. These are rapidly disappearing owing to the increased tobacco cultivation on it.

Landing on the coast, other than by making use of the river channels, is in no case advisable and is impracticable in the event of any sea or swell, which occurs particularly

during the northeast monsoon. At high water, during calms, landing may be effected on the sandy beaches, but not where mangroves exist, as there the ground, if any, is all soft mud. In clear weather some low hills and the mountains inland referred to below will be sighted from the offing above the trees on the coast.

In most places the shore may be approached by the lead.

5–21 **Aspect.**—About 53 miles westward of Ujung Tamiang, in Gajuland *(4°15′ N., 97°25′ E.)*, is the eastern end of the Acheh Range, with a noticeable peak, 10,202 feet high, the highest point of a broad mountain ridge. The waterfall, 2,887 feet in height, about 23 miles from the coast and northeastward of the mountain, is a conspicuous object in clear weather to vessels northward of Ujung Tamiang. Gunung Pongongesong, a broad top with three peaks, 48 miles southward of it, is 9,416 feet high, and there are others farther southward of nearly the same height.

About 16 miles southward of the waterfall is the northern end of the Alas Range in Alas Land; this range extends about 50 miles in a north and south direction. Gunong Bandahara, one of the highest peaks, is 9,416 feet high. Gunong Sangkapani two rounded cone-shaped hills, 6,129 feet high, lies northeastward of Bandahara, and Segama, 6,496 feet, and Gunung Langsar, 4,692 feet farther northwestward. Segama has two peaks, 1,000 yards apart, and are in line on a southwest bearing.

Southward of the sources of Deli River, in Batakland, is the Batak Range, extending nearly parallel to the coast for about 36 miles; Jinabung *(3°11′ N., 98°23′ E.)*, 8,186 feet high, is a volcano of a regular conical form at the back of the range, and, being the highest, is usually to be seen over it; fumes are at times seen rising from its crater.

There are other mountains of about 6,000 to 7,000 feet high in the vicinity.

Between Langsar and Aru Bays, at about 6 miles back, ranges of hills attain a height of 300 to 600 feet; but eastward of Aru Bay the rise is much more gradual. The coast between Langsar Bay and Ujung Tamiang is intersected by a number of small streams, with sandy spots in places and clumps of casuarina trees fronting the regular growth of trees. A few fishing huts are generally found in the mouths of the streams.

5–22 Coast *(H.O. Chart 3120)*—The coast between Ujung Tamiang and the mouth of Langkat River forms a bay about 25 miles wide, and extending about 9 miles back from between these points, with two large islands at its head; the northern one is Pulo Kumpei and the southern Pulo Sembilan; at its head is Aru Bay. This bay is fronted by mud flats with depths of less than 1 fathom, varying in distance from 1.5 to 5 miles offshore, the 3-fathom curve being about 6 miles distant from the center of the bay, from which the depths decrease gradually except off the extreme points. The bottom consists of mud, sand, shells, and clay.

Fishing stakes exist on some of the banks and are sometimes placed as far off as to be in a depth of 7 fathoms.

Between Ujung Tamiang and Raja Ulak River; 4 miles southeast of it, there are several streams of little use and sandy beaches, upon which, near Pulo Krung Beka, there is a village of Chinese fishermen and traders. Raja Ulak may be distinguished from a considerable distance by its row of dead trees and its sandy beach, which is visible toward

low water. Southward of the latter, as far as Pulo Kumpei, the coast consists entirely of mud covered with mangrove trees.

There are several unimportant streams between Ujung Tamiang and Pulo Kumpei, mostly dry in some portions of their channels at low water. The Raja Ulak, which has a broad mouth, has a dry sandbank across it at low water. Ayer Masin River and the Seranjaya both enter the sea northward of Pulo Kumpei, and barred by the same flats which extends about 2.5 miles offshore. The high-water depths over it to the Ayer Masin is about 8 feet, and to the Seranjaya about 10 feet. Both are deeper within, the latter deepening to 6 and 7 fathoms in places, with a branch from it leading westward of Pulo Kumpei into Aru Bay.

There are some fair-sized villages 4 miles up the Ayer Masin with which a fair amount of traffic is done by local small craft; its entrance is difficult to distinguish.

Pulo Kumpei and Pulo Sembilan, fronting Aru Bay, having tall trees growing on them, are visible from a distance of about 16 miles. Thence eastward to Gebang, about 12 miles southeastward, the coast is all mud and mangroves, but beyond there are sandy spots in places with casuarina trees.

Flat Hill, 508 feet high, 6 miles within Pulo Kumpei, is a useful mark.

5–23 This section has been deleted.

5–24 **Pulo Kumpei (Koempai)** (4°11'N., 98°14'E.) consists principally of firm and comparatively high ground, low at the shores, which are for the most part overgrown with mangroves. The mud flat dries 1.5 miles off its northern end and the depth is under 6 feet for 1 mile beyond it.

The settlement is at the southern point, and on the southeastern side are sandy beaches and a group of casuarina trees.

The island is covered with tall trees, the tops of which are visible from a considerable distance; the highest is about 1,000 yards from its southern end, has a round top, and is easily identified. In the middle of the island there are pepper gardens and other plantations.

5–25 **Pulo Sembilan,** close southward of Kumpei and also covered with tall trees, has mangrove shores, except at the northwestern and southern extremities, which consist of sand. Mud flats dry out as charted for a distance of 3 miles or more, forming the northern side of Sembilan Channel. On the northwestern extremity of the island there are a few fishermen's huts, and upon the southern point there is a village.

5–26 **Aru (Aroe) Bay,** within Pulo Sembilan, is 6 miles in length and 3 miles in breadth, but a large portion of it is dry at low water, with numerous shallow passages leading to the several streams discharging into the bay; these unite in two channels which may be con-

sidered as the continuation of the largest of these streams and principally of the Besitan and Salahaji. Due to the irregular bottom in this area the lead is unreliable. Points, groups of trees, and river mouths must serve as the only landmarks.

Toward the head of the bay are a number of mud islets overgrown with mangrove trees, and the shores of the bay are mostly of the same formation, so that, with the exception of the settlements on Pulo Kumpei and Pulo Sembilan, there are not others of any importance until some distance up the rivers.

Entrances.—Kumpei Channel, the northern entrance to Aru Bay, is between Pulo Kumpei and Pulo Sembilan; the southern or Sembilan Channel, lies between Pulo Sembilan and the mainland, and is the deeper of the two; between these channels are a number of ridges which dry in places at low water.

Fishing stakes and inclosures exist on these banks.

Caution.—The buoyage in Kumpei, Sembilan and Babalan Channels may be changed due to changes in the fairways.

5–27 Kumpei Channel.—The bar of the Kumpei, 2.5 miles across, with depths under 3 fathoms, had in 1958, a depth of about 7 feet at low-water spring tides, over sand and mud, in the channel indicated by the buoys. The banks on either side of the fairway are composed of hard sand.

Anchorage.—There is good anchorage about 1,000 yards above Kumpei settlement in a depth of about 5 fathoms; here the fairway is about 1,000 yards wide. The water is much deeper and irregular off the settlement. A patch of 3 fathoms, stony bottom, lies 350 yards 214° from the southern point of Kumpei; it is sometimes marked by tide rips.

Tides.—It is high water, full and change, at noon; springs rise 8 feet. At Kumpei settlement the tide is 30 minutes later, with 6 inches more rise, and probably more in Aru Bay. The highest tides occur nearly 2 days after full and change of the moon. There are two high and two low tides in 24 hours; and from 2 days before to 5 or 6 days after the full and change the rise is nearly as much as at the springs; neaps rise about 3 feet. See also nature of the tides, chapter 1.

Tidal currents.—On the bar the flood currents mostly set south-southwest and the ebb northeast by north at the maximum rate of about 2 knots; but seaward of the outer buoy they set across, the flood setting southeastward from about 3 hours before to about 3 hours after high water, and the ebb in the opposite direction.

5–28 THE SETTLEMENT, on the southern point of Pulo Kumpei, has no European inhabitants; a vassal of the Sultan of Langkat and a native overseer are stationed here. The inhabitants are either fishermen or agriculturists, and considerable traffic is carried on by canoes between the settlement and others on the streams in Aru Bay.

Communications.—Steamers call here occasionally.

5–29 Sungi Salahaji discharges into the northwestern portion of Aru Bay, northward of Tanjung Siata, nearly 5 miles within Kumpei settlement, with a drying bank in its mouth. A narrow channel southward of the bank has a depth of 9 feet least water, but it is not easily navigated.

Westward of Tanjung Siata the ground is firm, rising behind, and here is the abandoned settlement of Pangkalan Tanjung Batu.

5–30 Sembilan Channel is the deeper into Aru Bay; its entrance, which lies about 5 miles southeastward of that of the Kumpei Channel, had a depth of 10½ feet (1958) on the outer bar. The distance between the outer and inner bar is nearly 10 miles, so that if a vessel wishes to continue to Pangkalan

Susu without stopping, it should pass over the outer bar while the water is rising. Vessels can not cross the bar if loaded to a draft greater than 18 feet at neaps and 20 feet at springs.

The inner bar, about 1 mile northeastward of Pangkalan Susu, had a least depth of 10 feet (1958).

The depths on both bars are very irregular. The bottom of the inner bar consists of very hard gray mud intermixed with gravel and sand. This must be taken into consideration in sea and swell.

The channel is principally navigated by the aid of buoys and light buoys. In 1959, the outer bar channel was marked by conical buoys surmounted by a cone topmark, and equipped with radar reflectors. Southwestward of the bar, Sembilan Channel was marked by buoys and light buoys. Those marking the north side of the channel are odd-numbered, conical in shape, surmounted with cones if not lighted. Those marking the south side of the channel, are even-numbered, can shaped, and surmounted by cylinders if not lighted.

The edges of the channel, especially in the bend, are steep-to and in some places dry at low water. The edges are well defined at high water by discolorations.

Near Pangkalan Susu the banks are firm, without mangroves, and considerable depth is found close to, but the depths decrease rapidly westward of Pangkalan Susu. In the channel between Panjang and the island southward thereof there is a depth of 19 feet, but the channel is narrow and crooked and has a strong current as it is the most important outlet of the eastern branch of the Besitan River.

The depth from the above channel to the mouth of the Besitan River is only 9 feet.

There is but little depth southward of the above-mentioned island. One small and two large rivers empty into the channel through a common mouth close southwestward of Pangkalan Susu.

The bottom of the Sembilan Channel consists principally of mud and sand, and the banks consist principally of sand, while the shoalest patches and ridges consist of hard sand.

WRECKS.—Numerous wrecks exist off the entrance to the Sembilan Channel and in the Sembilan Channel.

One of these wrecks, located about 3 1/2 miles eastward of Pulo Sembilan and in the fairway of Sembilan Channel, is marked by a light buoy.

OUTER LIGHT BUOY, painted in red and white vertical stripes, is located about 8 miles eastward of the southeast point of Pulo Kumpei. The channel is marked by BUOYS and LIGHT BUOYS.

5-31 ANCHORAGE.—Eastward of Sungi Siur, at a distance of at least 800 yards to clear a submerged pipeline, there is an anchorage in 20 feet at 200 yards offshore. The sea does not usually reach in so far, but an ebb current of 2 knots must be reckoned on.

Large vessels anchor seaward of the outer lighted buoy in about 10 fathoms.

PROHIBITED ANCHORAGES.—A submarine telephone cable extends across the Sembilan Channel from a hut on the left bank of the Sungi Siur, 1,312 yards 251° from the watch tower on Pulo Sembilan, to a similar hut on Pulo Sembilan 1,025 yards 291° from the same watch tower.

On each side of the hut on Pulo Sembilan a red beacon with triangle is placed to mark a zone extending 11 yards on either side of the cable where the anchoring of vessels is prohibited.

A submerged pipe line extends in a southwesterly direction from a position about 300 yards westward of the staff on the south end of Poelau Sembilan to a position about 1/4 mile east-southeastward of the mouth of the Sungi Siur. Anchorage in the vicinity of this pipe line is prohibited.

5-32 DIRECTIONS.—It is not advisable to attempt this channel without local knowledge or the depth on the bar being accurately known. Vessels entering should enter about three-quarters flood, so as to be able to cross the inner bar with 13 feet least water, below Pangkalan Susu, if bound there.

The bottom on the other bar is fairly hard, and in the channel mud and sand.

The outer light buoy may be made from the southeastward by approaching Flat Hill on

the bearing of about 290°, which leads directly to it, and from the northward by giving Ujung Tamiang a berth of about 5 miles, and from thence steering 150°, until sighted, and using the lead. From abreast the outer light buoy steer to pass between the buoys marking the sides of the channel.

5–33 Sungi Besitan discharges into the southern head of Aru Bay, is navigable for vessels of about 7 to 9 feet draft, and may be approached by either the Kumpei or Sembilan Channels. The military post of Bukit Kubu is located on it at about 12 miles from the village on Pulo Kumpei.

5–34 PANGKALAN SUSU is the small settlement located about 3½ miles above that on the south end of Pulo Sembilan. The settlement has a small refinery (1960), but its primary function is as a shipping point for crude oil. Prior to World War II there were fairly sizeable oil refinery and storage facilities at the settlement, but because of the war and its aftermath they were almost totally destroyed. Under the Indonesian government, reconstruction is proceeding and production is being resumed. A small oil refinery was reported in operation in 1961.

Facilities.—A timber oil-loading pier at the settlement has a least depth of 6 feet alongside in two berths, and a maximum depth (at high water) of 16 feet. A mud-bottomed channel to the pier permits access of tankers of 3,000 tons. The tankers shuttle between the pier and the anchorage where the oil is transferred to ocean-going tankers.

It was reported (1960) that minesweeping operations were in progress in preparation for the construction of an oil terminal capable of accommodating 30,000-ton vessels.

5–35 Sungi Babalan lies about 4 miles southeastward of Pulo Sembilan, is 600 yards in breadth at its mouth, has a least depth of 2 feet over hard sand and mud in its channel abreast the tide gauge, and is available for small craft with local knowledge. There is a bar with same depth just below Pangkalan Berandan. The channel is marked by buoys. The remains of a beacon marks the western side of the entrance to the river. In 1958, a tall derrick stood about 1 mile westward of the ruined beacon.

About 4 miles above its mouth, on the southern shore, is the port of Pangkalan Berandan (Pangkalan Brandan). This port has a small refinery. Reconstruction of war damage is proceeding, but no facilities for ocean vessels are available.

WRECKS.—A submerged wreck lies sunk about 6 miles northeastward of the mouth of Sungi Babalan, and a wreck with mast showing lies sunk about 7 1/2 miles northeastward of the mouth of this river.

TIDES.—It is high water, full and change, in Babalan Channel at 15 minutes; springs rise 7 feet.

At Pangkalan Berandan it is high water about 1 hour later. The currents in the entrance run in the direction of the channel from about half ebb to half flood.

5-36 FACILITIES.—A 4,600 ton vessel may be accommodated in depths of 39 1/3—49 1/4 feet. The government wharf is 90 feet long and has a depth alongside of 5 feet. A boatyard constructs 10-ton wooden vessels. There is radio communication with Djkarta. The Permina Hospital can accommodate 150 patients in locally standard comfort.

5-37 SUNGI LEPAN (4°04'N., 98°22'E.), eastward of Babalan River, is narrow and tortuous, and has a depth of about 1 foot in its approach. Far inland are the petroleum springs of the Bataafsche Petroleum Maatschappij.

5-38 COAST.—Sungi Gebang and Sungi Serapoeh lie 8 and 9 miles, respectively, eastward of Sungi Babalan; the coast between is composed of mud and mangroves, but on the eastern side of the mouth of both streams is a sandy beach.

SUNGI GEBANG—BUOY.—A conical buoy, with a red St. Andrew's cross topmark, and painted in red and white vertical stripes, is moored about 3 3/4 miles northward of the entrance to Sungi Gebang, a little northeastward of the 1-fathom edge of the bank; a similar buoy is moored about 1/4 mile to the north-eastward. The depth over the mud flat in the approach to the river is about 11 feet at high-water springs.

SUNGI SERAPOEH (4°02'N., 98°27'E.) is the best channel to Tanjung Pura and may be navigated by vessels up to 180 feet in length. The mouth of the Serapoeh is easily recognized. Between the Gebang and the Serapoeh the coast consists principally of mud overgrown with tall mangroves. Between Serapoeh and Langkat River there is a sandy beach overgrown with dark, tall trees. On the right bank, close to the mouth of the Serapoeh, are a few tall casuarina trees. The bar has a depth of 4 1/2 feet at low-water springs.

A white wooden rectangular BEACON stands near the western side of the entrance.

5-39 DIRECTIONS.—Local knowledge is a prerequisite for navigation in this area. Between the buoys and the river entrance the tidal currents set across the channel, the flood toward the southeast and the ebb to the northwest.

Whenever a heavy rainfall takes place in the upper course of the river it is swelled with rain water, making navigation difficult; great caution is necessary in making the bends.

UJUNG DAMAR is the most projecting portion of the coast between Sungi Serapoeh and Langkat River. The tall trees in its vicinity are visible from a considerable distance.

5-40 LANGKAT RIVER, about 1,000 yards wide in its entrance, discharges eastward of Ujung Damar. It is easily identified by the tall trees in the vicinity.

The flats in its approach, which extend about 4 miles off, are very steep-to and have a low-water depth at springs of about 3 feet; the eastern side of these flats should not be approached to less than 14 fathoms. Within the flats the depths are not less than 2 fathoms at low water. The bottom is composed of tolerably hard sand and mud, and the banks on either side are hard, steep-to, and dry in places at low water, as charted.

About 2 miles above the east point of entrance the river is only about 45 yards wide, leaving barely room for small craft to pass one another.

The river rises at the foot of the Bendo Benuwa, northern end of Toba Lake; it flows through a cleft in the highland, makes a sharp bend by the Gunung Jinabung, and forces its way over the mountains, where it forms a waterfall, said to be from 300 to 900 feet in height. Farther on it flows through the great plains to its entrance.

TIDES.—It is high water, full and change, at 1 hour; springs rise 7 feet.

TIDAL CURRENTS.—The currents run at the rate of 2 1/2 knots in the river.

5-41 TOWN (3°54'N., 98°25'E.).—Tanjung Pura, about 12 miles up the river, is the capital of the Province of Langkat, and the seat of government. There is a garrison, a post, and telegraph office. There is a screw pile wharf, about 90 yards in length, near the custom office.

COMMUNICATION.—Steamers are in regular communication with Penang and Deli.

5-42 COAST (H.O. Chart 3079).—Between Langkat and Deli Rivers, in the various river mouths are a number of islets the most prominent of which is Tapak Kuda, about 2 miles eastward of Langkat River, which is formed of sand, covered with tall casuarina trees; a shallow bank extends about 1 mile off it. Pulo Paho, southeastward of it, is of a similar character, composed of mud and mangroves, with several high solitary trees and also several groups of high trees.

Tapak Kuda gives a good radar return from a distance of 12 miles.

WRECK.—A small coaster lies stranded to the northward of the mouth of the Tapak Kuda River in a position about 1 1/2 miles northward of the northern extremity of Tapak Kuda Island.

TAPAK KUDA RIVER, westward of these islands, has a depth of about 6 feet in its approach, in a narrow channel over the bank in which the tidal currents ran with considerable strength; it can only be entered by small craft locally acquainted. The small rivers between it and Deli River are nearly dry at low water, and the coast is fronted in places by a shallow bank extending to the distance of about 2 miles.

GADING REEF is a ridge, with depths of 2 1/4 to 3 fathoms, over hard bottom, extending from Batu Chamal, about 7 miles in a northwest direction parallel to the coast, its northern extremity being on the parallel of the mouth of Tapak Kuda River; depths of less than 5 fathoms extend 4 miles farther northwestward. It may be approached by the lead, and generally shows discolored water; there are numerous fishing inclosures on it.

Deli Bank is a shoal area of 4 fathoms, composed of hard sand, located about 16 miles eastward of Batu Chamal and 10 miles southeastward of the Outer Light Buoy. Caution should be used when approaching Belawan Deli from the southward.

UJUNG AHU (Ojong Ahoe), about 6.5 miles southeastward of Tapak Kuda River, has a sandy beach with a small grove of casuarina trees, which, however, is difficult to distinguish from the offing. Coming from the eastward, the point is well defined.

UJUNG BATU CHAMAL (Beting Chamar) is a rounded point situated about 4.5 miles southeastward of Ujung Ahu. It has a sandy beach on which are a couple of casuarina trees. It is not easily identified unless coming along the coast from the westward or eastward.

5-43 COAST.—From Batu Chamel past Deli River to Sungei Serdang, a distance of 15 miles southeastward, the coast consists almost entirely of mud and mangroves, but beyond Sungi Serdang and past Ujung Sibunga Bunga there is a considerable amount of sandy beach, with casuarina and other tall

trees for 18 miles, as far eastward as Mengkudu. From Mengkudu beyond Bharu Bay there is again mud and mangroves, suceeded by sandy shores with a luxuriant growth of casuarinas, up to Tanjung Tanjung, at about 20 miles farther. The whole coast is fronted by a shallow bank, varying from 1,000 yards to 3 miles offshore, with Deli Bank and the Bunga Shoals in the offing.

As most of the plantations owned by Europeans lie near the coast, there is local traffic for small steamers, for which the mouths of the important streams are beaconed by small lights, of no use to passing vessels.

There are also, at several places along the coast, fishing stations of some size, of which, however, but little can be seen from the offing. There are also numerous fishing stakes on the banks fronting the shore, mostly within the 3-fathom curve, but in places they extend out to the depth of 5 fathoms.

Most of the banks can be approached by sounding, but the bank on the east side of the approach to Deli River is steep-to, as is also that eastward of Mengkudu Bay. The depths also are somewhat irregular off this coast, and the bottom contains more stones than that farther westward.

ANCHORAGES.—There is good anchorage in most places along this portion of the coast.

5-44 DELI RIVER (H.O. Chart 3079).—About 6 miles southward of Batu Chamal are two fairly wide river mouths, located about 1 mile apart. The southern of these two mouths is that of the Deli River which on account of a constant silting up and a railroad bridge over it is of no importance to navigation.

The northern mouth is the Belawan River, which leads to the town of Belawan Deli, which since the construction of the railroad has become the harbor of the Deli Province.

DEPTHS.—In 1965, the main channel had a least depth of 24 feet. Depths cannot be relied upon as dredging is infrequent.

In mid-1960, a vessel drawing 26 feet 2 1/2 inches touched bottom at high water in the center of the approach channel abreast No. 5 Buoy.

In December 1965, the channel was reported to have a least depth of about 18 feet at low water springs.

5-45 CAUTION.—Suction dredges are at work in the entrance channel, and will show the following signals in addition to the regulation marks and lights:

By day, if the dredges are at work—

A cone at the yardarm indicates that vessels should keep to the eastern side of the channel.

Two cones at the yardarm indicate that vessels should keep to the western side of the channel.

If the dredges are anchored with the suction apparatus on the bottom, an anchor at the yardarm indicates that vessels should pass on the side on which the anchor is shown.

By night, if the suction apparatus is on the bottom—

A green light at the yardarm indicates that vessels should keep to the eastern side of the channel.

A red light at the yardarm indicates that vessels should keep to the western side of the channel.

When the suction apparatus is not on the bottom, no special signals will be made.

When two dredges are working at a distance of not more than a quarter mile apart, in the event of a vessel approaching, the dredger farthest away from the approaching vessel will cross over to the same side of the channel as the dredger nearest the approaching vessel.

Outlying anchors of dredges working in the channel are marked by drums. Vessels are prohibited from passing between the drums and the dredge.

Great care must be exercised in passing a dredger on the bar, as the narrowness of the channel permits of giving her very little sea room.

Within 1 mile of Tandjung (Ujung) Belawan, the northern entrance point, and up river the sides of the channel are steep-to, the east side being composed of hard sand, while to the westward is the extensive mud bank which fronts the shore. The bottom in the fairway is mud.

The bank on the eastern side of the dredged ship channel was reported to be extending. The seaward, or northern, extremity of this bank is marked by a red spherical BUOY.

CAUTION—WRECKS.—Numerous wrecks exist in the approach and in the Belawan River. For information regarding these wrecks consult the latest editions of the best scale charts of the area.

5-46 CHANNELS—BUOYS—BEACONS.—A swept channel, 1,200 yards wide, leads from a position about 15 1/2 miles north-northeastward of Tandjung Belawan in a 225° direction to a position about 7 miles north-northeastward of the same point. This latter point is situated near the middle of a swept anchorage area. From this position a dredged channel 150 feet wide, leads across the bar to the port of Belawan. The principal aids to navigation in these channels are described below.

OUTER LIGHT BUOY, painted in red and white stripes and equipped with a radar reflector, is moored about 17 miles northeast by north-northeastward of Tandjung Belawan.

A LIGHT BUOY, painted in red and white horizontal bands, and equipped with a radar reflector, is moored about 7 miles north-northeastward of Tandjung Belawan.

A RADIOBEACON is located on the eastern side of Belawan Island.

RANGE LIGHT BEACONS.—Lights are shown from five iron beacons, numbered 1 to 5 from seaward, which are all situated on the eastern side of the channel. No. 2 light beacon is located about 2 miles northeastward of Tandjung Belawan. Nos. 1 and 3 light beacons are located, respectively, about 3/4 mile northward and 1/2 mile southwestward of No. 2 beacon. Light beacons No. 4 and No. 5 are located, respectively, about 3/4 mile eastward and southeastward of Tandjung Belawan. Nos. 1 and 2 light beacons in range 187° lead through the north part of the channel. Nos. 3 and 2 beacons in range astern about 040° lead through the south part of the channel. Nos. 4 and 5 beacons in range about 200 1/2° lead through the central part of the channel.

The light on No. 1 Beacon is shown at a height of 39 feet; the lights on Beacons Nos. 2, 3, 4 and 5 are shown at a height of 20 feet. The above range beacons, with the exception of No. 1, have perches with topmarks. The perches of front range beacons have circular topmarks; the rear range beacons have triangular topmarks. No. 1 Range Beacon has two perches, one with a circular topmark and the other with a black cylindrical topmark. In 1965 both perches were reported destroyed.

Several BUOYS and LIGHT BUOYS also mark the channel into the river.

It was reported (1963) that the buoys were unreliable.

RANGE LIGHTS.—A light is shown from the ridge of the easternmost shed at Belawan, and another light is shown from a position about 1/4 mile west-southwestward. These lights in range 238°, lead to the quay.

LANDMARK.—A conspicuous clump of trees is located on the northern end of Tanjong Beting Tjamar in a position about 8 miles north-northwestward of Tandjung Belawan.

NOTE.—It has been reported that Belawan-Deli is a difficult port to locate from seaward. This is reportedly due to a lack of good landmarks, navigation aids and the surrounding land area which is low. Frequently there are several ships anchored in the vicinity of the channel entrance, and they can be used as an indication of the location of the port.

In 1960, it was reported that the coast between Tandjung Belawan and the aforementioned clump of trees was radar-conspicuous. A discernible opening—backed by higher land—shows about 2 1/2 miles south-southeastward of the clump of trees.

5-47 ANCHORAGE.—A swept anchorage area, about 3 miles long and 1 1/4 miles wide, extends in a west-northwesterly and east-southeasterly direction with its southeastern extremity in a position about 6 miles north-northeastward of Tandjung Belawan. Good holding ground is provided at this anchorage in 6 to 11 fathoms, mud and sand.

PROHIBITED ANCHORAGE.—Vessels are prohibited from anchoring within a distance of 650 yards on either side of the axis of the dredged channel leading to Belawan, up to a north limit of lat. 3° 55′ N. Within the harbor limits, anchoring is prohibited eastward of long. 98° 41′ E.

DEPTHS.—THE HARBOR has a depth of from 4 to 6 fathoms but it is somewhat narrow in places, rendering it desirable to moor. There are wharves in front of the town for the use of local steamers, which lie alongside them. Depths of from 5 to 7 fathoms are maintained for some distance above the town; but only steam launches and boats can ascend to Labuan Deli.

5-48 TIDES.—Tidal heights at Belawan-Deli bar (3° 50′ N., 98° 43′ E.) above datum of soundings are: MHWS 8.0 feet, MHWN 5.8 feet, MLWS 1.8 feet, MLWN 4.0 feet. The highest level of water is reached in about the middle of May and November.

There is a tide gauge on the edge of the drying flat about 2 3/4 miles north-northeastward of Tandjung Belawan.

TIDAL CURRENTS.—To seaward of the dredged channel both the ebb and flood currents have a maximum velocity of about 2 knots, the flood setting south-southeastward and the ebb north-northwestward. In the dredged channel the current generally conforms to the direction of the channel. For short periods during spring tides the ebb current attains a velocity of 3 to 4 knots and the flood 2 knots. During neap tides the tidal currents are often negligible.

PILOTAGE.—Pilotage is compulsory for merchant vessels over 350 gross tons, and is recommended for naval craft. Pilots board the vessels in the vicinity of the buoy located about 7 miles north-northeastward of Tandjung Belawan. Incoming ships should notify the Harbor Master by radio of their arrival time well in advance, thus avoiding delay at the pilot station. In late 1960, it was possible to arrive or leave the port as late as 2000 hours. The pilot vessel is a 40-foot launch with superstructure aft, and is painted olive brown.

5-49 BELAWAN-DELI (3°47′N., 98°41′E.), is formed chiefly of mud and mangroves in great part flooded at high water, but it has been largely cleared, especially near the harbor, and many swamps have been filled in with mud collected by the dredgers. On the west side is the town and harbor of Belawan-Deli and on the east is a fishing village. Belawan-Deli is the fifth port of importance in Indonesia, ranking after Djakarta, Surabaya, Semarang, and Cheribon. It is the first port of importance of Sumatra. Its importance is due to the agricultural industries of the east coast of Sumatra, it being the port of collection for the large and increasing exports of that section. Expensive dredging work is constantly necessary to keep the port and channel from filling up, consequently the port charges on vessels are exceedingly high.

WHARVES.—Ocean Quay, located on the northern side of Belawan Island, is about 1,300 yards long with depths of 29 feet alongside. Deep draft vessels may experience difficulty in getting alongside and in maintaining their position at low water. The quay has rail clearance, and is equipped with two 3-ton and three 5-ton electric portal cranes. In 1965 it was reported that all were inoperable.

Work continues in 1965 to build a new quay southward of and adjacent to Ocean Quay. When completed, the quay will be 2,050 feet long with a depth of 34 3/8 feet alongside. The turning basin is to be dredged to a depth of about 49 feet.

It was reported (late 1965) that the new quay adjacent to Ocean Quay had been completed and that depths alongside and over the major portion of the basin were 24 feet 3 inches at LWS.

A new oil pier was nearing completion (1965) about 1/2 mile eastward of the east end of

Ocean Quay, and the land southward of it was being reclaimed. When completed the pier will be about 807 feet long, with a depth of 34 3/8 feet alongside.

Ocean Wharf, located close westward of Ocean Quay, is about 585 feet long with a depth of about 17 eet alongside.

A T-headed oil pier, located on the western side of Belawan Island, is about 55 feet long at its head and has a depth alongside of about 21 feet. A mooring buoy lies off each side of the pier head.

Another quay, located southward of the above oil pier, is about 675 feet long with a depth alongside of about 17 feet.

Berthing space for three oceangoing vessels is available at Back Creek at the southwest end of Belawan Island.

Several mooring buoys are moored at intervals of about 410 feet in midchannel off the wharves on the west side of the island.

REPAIRS.—Small repairs only can be undertaken in the workshop at Medan.

SLIPS.—There are two slips, each with a lifting power of 250 tons.

SUPPLIES.—Fuel oil and fresh water are piped to Ocean Quay, and water is also piped to Ocean Wharf. Fuel oil can be supplied at the rate of 85 tons per hour. Water is also available by barge. All water must be treated or boiled. Diesel oil can be obtained. Limited supplies of meats, fresh fruit and vegetables are available, but the usual precautions against dysentery should be taken before eating fresh fruits or vegetables obtained in the tropics.

Port and harbor facilities include two tugs of 650 hp., each equipped with firefighting gear and salvage pump, one tug of 350 hp., equipped for firefighting, two lighter tugs, 10 lighters with a combined total capacity of 700 tons, one 65-ton floating crane, one mobile and two caterpillar cranes, several fork lifts, and over 535,000 square feet of covered storage.

COMMUNICATION.—There is constant steam communication maintained by 15 steamship companies with Penang and Singapore. Small mail steamers ply the eastern coast of Sumatra.

Railroad communication with Medan, which is the railroad center, with branches to other parts; also telephonic communication with Medan, and telegraphic communication with Tapanuli on the west coast. Submarine cables are laid to Penang and Olehleh. (See also ch. 1.) There is a radio station at Belawan.

TRANSPORTATION.—Belawan-Deli is the terminus of the Deli Railway to Medan.

CLIMATE.—The town of Belawan-Deli on account of its unhealthfulness should be avoided.

HOSPITAL.—There is a government auxiliary hospital in the port.

DERATTING.—The port issues Deratting Exemption Certificates. Deratting can be carried out.

DELI DISTRICT is made up of three states; Deli is the center under a sultan; Langkat to the northward under a native chief or pangheran; and Serdang to the southward, also under a sultan, the whole being under the Govenor of North Sumatra at Medan.

MEDAN (3°36′N., 98°40′E.), the capital of Deli, and about 12 miles from Belawan, is the headquarters of the Govenor of North Sumatra. It is an important commercial and tobacco growing center. The layout is rectangular with well-drained streets 44 to 70 feet wide. The commercial section lies westward of the railroad station and includes reinforced concrete buildings. In the shopping district there are many Indian and Chinese brick shop-houses, and a few European stores. Principal buildings include the Governor's house, government offices, town hall, law courts, the new university and a prominent water tower. There are four hospitals and one x-ray plant in the town. In 1955 the estimated population was 310,000.

COMMUNICATION.—There is communication with all parts of Sumatra by air, road, rail and telephone systems. Communication by sea is made from Belawan, 14 miles northward. There is a radio station open to the public.

CLIMATE.—The healthfulness of the country may be considered good, though unseasonable weather often brings epidemics of fever and beriberi, especially among newcomers. Isolated cases of cholera occur. The mornings are fresh and cool.

5-50 COAST.—Between Deli River and Tanjung Tanjung, 55 miles southeastward, there are several small rivers the entrances to which are passable only by small trading craft at or near high water; the most important have small lights at the entrances.

Ujung Perling, 2 miles southeastward of the Deli River, is overgrown with mangrove trees, of which a mud bank dries at low water to the distance of 1.5 miles. About 1 mile and 3 miles southeastward are the mouths of the Sungi Panglima and Sungi Perchut, respectively; both entrances are dry at low water. There is a fishing station at the mouth of the latter, and Perchut village is about 4 miles from the entrance.

Sungi Serdang, about 8 miles southeastward of Deli River, flows through one of the Deli tobacco-growing districts already described and is about 90 yards wide in its entrance and nearly dry at low-water spring tides in its approach; the shore bank on either side dries off about 1.5 miles. Rantau Panjang village is situated at the mouth, and higher up there are several villages on both banks.

Westward of the mouth is a strip of sandy beach, and beyond it the Sungi Tuan (Baru). Eastward of the mouth of the Serdang, as far as Sungi Kuru, the shore is sandy, with coconut trees at intervals, near which are fishing huts, and 2.5 miles eastward of the Serdang is Serdang Tree, 197 feet in height, close to the shore and forming a conspicuous mark.

5-51 Communication.—About 6 miles from the entrance to the Sungi Serdang and not far from the river bank is Serdang station of the Deli Railroad.

Supplies.—A few supplies are obtainable at Rantau Panjang.

5-52 Sungis Kuru, Ular, and Denai, from 3 to 5 miles eastward of Sungi Serdang, are all nearly dry at low water; the two latter are about 600 yards apart; the coast eastward of Sungi Kuru is chiefly mud and mangroves. Near Sungi Denai is an extensive grove of trees.

Ujung Sibunga Bunga.—At 1 mile eastward of Sungi Denai the mangroves give place to a sandy beach, which continues to Ujung Sibunga Bunga, with casuarina trees in places. Near the point there is a small but dense wood of these trees which serve to distinguish it in the offing. The bank dries off here about 300 yards only, and there is a depth of 3 fathoms at about 1,500 yards offshore. Patches of 4 fathoms, with deeper water around, lie about 2 miles off.

Sungi Perbaungan, dry at low water in its entrance, which is about 50 yards in breadth, lies close southward of Ujung Sibunga Bunga; between, within the hook of the point, is a shallow and muddy lagoon about 1 mile in length. There is a fishing station in the cluster of casuarina trees near the western point of entrance where small local supplies are obtainable.

There is a pier and shed at the west point where a small light is shown for local craft. The buildings are white and may be seen at some distance when bearing westward of 224°.

5-53 Communication.—A road leads through tobacco plantations to the Perbaungan station of the Deli Railroad, distant about 5.5 miles in a direct line.

5-54 Sungi Sijengi.—From Sungi Perbaungan, the coast is sandy to Tanjung Sijengi, which point is marked by some casuarina trees; some villages lie within the point, but are not visible from seaward. The shore bank dries off about 600 yards. Sijengi Ridge is to be described subsequently.

Teluk Mengkudu.—Between Sungi Sijengi and the former position of Mengkudu Tree, 8 miles eastward, the coast, fronted by a sandy beach, forms a slight bight, known as Teluk Mengkudu, into which discharge the Sungis Baharu, Pa Nipa (Nipa) and Mengkudu, all small streams which dry at low water and have mud and mangroves at their mouths; there are villages near all these streams.

The depth in Teluk Mengkudu is 3 fathoms at 2.5 miles offshore.

5–55 **Sungi Bedagei,** about 8 miles southeastward of Sungi Mengkudu, is 65 yards wide in its entrance, with a depth of 1 foot at low water, spring tides, over the bank in its approach. The mud bank dries off to the distance of 600 yards. There is a little beach on either side of the mouth of the river, and from the offing a high wood just eastward of the river, and some groups of trees farther eastward, may serve to identify it. The village Tanjung Bringin is located at the mouth of the river.

Sungi Padang.—From Sungi Bedagei to Sungi Padang, 5 miles southeastward, the coast is all mud and mangroves. Sungi Padang is 800 yards wide at its estuary, and has a depth of 1½ feet at low water, spring tides, over the bank in its approach; the eastern point of the river has a small sandy beach, and the channel is 100 yards in breadth.

Wreck.—A stranded wreck lies about 1½ miles east-northeastward of the entrance to Sungi Padang.

5–56 **SETTLEMENT.**—The settlement of Bandar Kalipa is situated about 1,000 yards above the entrance on the western bank. Coasting steamers and other trading craft call here in connection with the tobacco plantations situated farther inland.

5–57 **Fishing stakes.**—On the coast bank there are several large fishing inclosures extending into a depth of 5 fathoms.

Tides.—Spring rise about 7 feet.

Sungi Pagurawan, 2.5 miles southeastward of the Sungi Padang, with a mangrove coast between, is 1,000 yards wide in its entrance, which, being open, is easily discerned from the offing, at 1 mile above the entrance; abreast the settlement on the eastern shore, it is 300 yards wide. The depth is only 1½ feet at low water, springs, in the channel over the bank fronting it. A conspicuous tree, 190 feet high, is charted on the eastern point of the entrance. A small round grove rises above the woods not far from this tree.

Beacons.—The channel is marked by beacons on either side as far as the settlement, the outer one being about 1,000 yards seaward of the mouth.

Sungi Pare Pare (Si Pari Pari) *(H. O. Chart No. 3740),* 3 miles southeastward of the Pagurawan, with a mangrove coast between, is about 1,000 yards wide in its estuary, which is known as Teluk Baharu, and has a least depth of 1½ feet at low-water, spring tides over the bank in its approach. The small settlement named Baharu, with but little trade, is not visible from seaward; there are others farther upstream. The shore mud bank dries off about 800 yards between the Pagurawan and Teluk Baharu, decreasing eastward toward Tanjung Tanjung to 200 yards, where it is sand.

Beacons.—The western side of the channel is unofficially marked by stake beacons, the outer one being about 600 yards northward of the east point; they are not to be depended on.

5–58 **Tanjung Badak Mati.**—From about 1 mile eastward of Teluk Baharu the coast gradually changes from mud and mangroves to a sandy beach, with casuarina trees in places.

Tanjung Badak Mati, 4 miles southeastward of the Pare Pare, is almost entirely composed of sand, and distinguished by a long row of casuarina trees. The small settlements on this coast are not usually visible from seaward.

Tanjung Tanjung (Mati Point).—About 3.5 miles southeastward of Badak Mati is Tanjung Tanjung, a somewhat prominent point, beyond which the coast turns sharply

to the southward. The coast between has a sandy beach and it is less densely covered with vegetation than that farther westward; at about 1,000 yards westward of the point there is a clump of casuarina trees, and the same distance beyond is a clump of coconut trees.

Sungi Tanjung, entering the sea at Tanjung Tanjung, is about 150 yards broad at its entrance, which has a depth of 6 inches at low water, spring tides; westward of the river there are shrubs and low trees, but there is a conspicuous casuarina tree on the beach at 1,000 yards westward of the mouth; 1,000 yards farther westward is a row of coconut trees. The eastern entrance point is thickly wooded with tall trees close down to the beach; at about 1 mile southward of it the sandy shore again gives place to mangroves. A portion of the coast bank, forming the eastern side of the channel to the river, covers at high water, spring tides, and off the point the bank dries about 600 yards, and is steep-to beyond. The tidal currents cause a race here.

The channel is unofficially marked by stake beacons.

5-59 SETTLEMENTS.—There is a small settlement, with customhouse, near the entrance, and several European tobacco plantations at about 4 hours' journey upstream. A small coasting steamer from Sungi Asahan calls here monthly.

5–60 Anchorage.—There is fairly good anchorage westward of the point in from 7 to 10 fathoms with the casuarina wood bearing 166°.

Off-lying banks.—Deli Bank is the general name of the banks located within the 10-fathom curve, with its north extremity about 15 miles northeastward of Ujung Belawan and from thence trending 22 miles southeastward, to its south extremity, which lies about 8 miles northeastward of Tanjung Sijengi.

Bunga Shoals are located on the south east part of Deli Bank, and consists of two parallel ridges of sand. The north ridge, with depths of from 1 to 3 fathoms, is 4 miles in length, in a northwest and southeast direction within the 3-fathom curve, with a bottom of mud, sand, and shells, tolerably hard.

The least depth on this bank, 1 fathom, over a bottom of hard sand, is found on the southeast point. This patch, which is steep-to and marked by tidal rips and discolored water, is located on the following bearings: The casuarina grove of Sibunga Bunga 231° and the entrance of Sungi Mengkudu 170°.

The southern ridge, at about 2 miles southwestward of the northern, with depths of 1¼ to 3 fathoms, is 4½ miles in length, within the 3-fathom curve, the least depth being near its center. The shallow portions of both ridges are generally marked by tidal rips and discolored water, and with any swell these will break. Between these shoals and the bank fronting the shore, ripplings and discoloration of the water are frequently observed.

5–61 Directions for clearing.—Pulo Berhala bearing 096° leads 1 mile northward of Bunga Shoals, and the same object bearing 079° leads southward of them. The western extremity of the casuarina trees on Ujung Sibunga Bunga bearing 185° leads westward, and bearing 250° leads

southeastward of them, but with depths of 4½ fathoms or probably less inshore of the southern ridge. It is not advisable to stand into less depths than 18 fathoms when passing these banks at night.

Sijengi Ridge, about 4 miles in length, lies parallel to the coast and 2 miles distant from the mouth of Sungi Sijengi; the least depth is 1¼ fathoms over tolerably hard sandy bottom, with depths of from 4 to 7 fathoms between it and the shore. Isolated patches of 4½ and 4¾ fathoms lie between it and Bunga Shoals.

Mati Bank, the western extremity of which is about 2 miles northeastward of Tanjung Tanjung, and about 13 miles westward of Pulo Salanama or South Brother, lies parallel to the coast, and is about 8 miles in length, 1 mile in breadth, with a least depth of 1½ fathoms. The 3-fathom patch off its northwest end lies 035° distant 2½ miles from Tanjung Tanjung. It is composed chiefly of hard sand, and is steep-to in places.

Beting Neneh, a patch of 2¼ fathoms, lies 1½ miles southeastward of the southeast extremity of Mati Bank.

5–62 Directions for clearing.—The group of casuarina trees 1,000 yards westward of Sungi Tanjung bearing 205° leads 1 mile westward of the 3-fathom edge of Mati Bank.

A wreck was reported (1946) to lie about 5 miles offshore and 10 miles southeastward of Bunga Shoals.

Outer Mati Bank, about 15 miles in length in a northwest and southeast direction, with a greatest breadth of 6 miles, has general depths of from 5¼ to 10 fathoms, with one patch of 4¾ fathoms, from which Tanjung Tanjung bears 218°, distant 7 1/3 miles; the bottom consists of mud, sand, and shells; the mud being mainly volcanic ashes. Some discoloration is observable during the strength of the tidal currents.

Tides.—It is high water, full and change, at Tanjung Tanjung at 3 hours; springs rise about 7 feet.

Tidal currents.—The flood or southeast current runs from about 4 hours before until 2 hours after high water, and the ebb the reverse at the rate of 2 to 3 knots at springs, respectively.

5–63 Pulo Berhala (Varela) *(3°47′ N., 99°30′ E.)*, lying about 25½ miles northward of Tanjung Tanjung, the nearest part of the island of Sumatra, is a good landmark, being visible from a distance of about 30 miles in clear weather. By night also it can usually be distinguished at a fairly safe distance.

Composed of rock thickly covered with vegetation, it is about 760 yards in length, in a northeast and southwest direction, by 660 yards in breadth, and the tops of its trees are 584 feet above high water.

It is steep-to on the northeast and southwest sides, but the 10-fathom curve is distant about 1,200 and 1,600 yards, respectively, from the northwest and southeast sides.

It was reported (1964) that Pulo Berhala is a good radar target at a distance of 32 miles.

Prohibited Area.—The area surrounding Pulo Berhala has been designated a prohibited area between parallels of latitude 3°43½′ N and 3°50′ N and between meridians of longitude 99°27′ E and 99°33′ E.

A wooded islet, 157 feet high to the top of its trees, lying 150 yards from its southeastern point, is connected with the island by a coral ridge dry at low water; at 1,000 yards northwestward of Berhala is a similar rocky islet, which shows white in places and is 167 feet in height to the top of its trees; there is a somewhat large grotto in it. Between Berhala and this islet there are depths of from 5 to 7 fathoms.

A coral reef, extending from 100 to 200 yards, fronts the southern sides of Berhala and has two sandy beaches separated by a rocky point, the eastern one of which affords the best landing; on the western beach a stream of water discharges in the rainy season. Natives of Sumatra visit the island to collect turtles' eggs.

Anchorage.—On the ridge extending southeastward of Berhala anchorage may be obtained in 9 fathoms sand and shells, about 800 yards from the nearest point of the island. The tidal currents do not run with full strength in this anchorage.

Berhala Bank, with a least depth of 6 fathoms, lies about 10 miles north-northwestward of Pulo Berhala, and affords good anchorage over mud and sand. On the edges of the bank, clay or loam of various colors are found.

Five miles southward of Berhala is another ridge, with a minimum depth of 8 fathoms.

A dangerous wreck is located about 21 miles east-southeastward of Pulo Berhala

An 11-fathom patch was reported to lie about 20 miles north-northwestward of the same island.

5–64 Discolored water—Phosphorescence.—The water is discolored over these banks during the strength of the tidal currents, and there are occasional tide rips. Strong tidal currents in conjunction with rapid changes in depth form troubled areas of water, whose upper surfaces often take the form of smooth eddying patches, followed by areas of broken water, giving a strong impression of shoals. This impression is strengthened by the fact that the vertical upward movement of the water brings mud from the bottom and causes sharply defined areas of discoloration. Off the shore banks and isolated shoals, as well as also off the mouths of the rivers, discolored water is met with. At some places on the coast, as at Aru Bay and Sibunga Bunga, a strong phosphorescence is noticeable off the mud banks fronting the shore, and where this bank is broad, as at Aru Bay, it is so much accentuated by a high wind that the light so given off is said to be the best indication of the nearness of land.

Tides.—It is high water, full and change, at Pulo Berhala at 2 hours 45 minutes: springs rise about 7 feet.

5–65 The Brothers *(H. O. Chart 3740)* consisting of Pulo Pandang and Pulo Salanama (Salahnama), are located 26 and 29 miles southeastward of Pulo Berhala, in the track of vessels navigating along the coast of Sumatra. They are visible from 18 to 20 miles in clear weather, and being steep-to beyond the distance of about 300 yards would usually be seen at night in time to avoid them. They are uninhabited, but natives from Sumatra usually visit them in the turtle season and for bamboos, which grow on Salanama, the south islet.

Pulo Pandang, or North Brother, is a thickly wooded, rocky islet about 800 yards in length, consisting of two parts, connected together by a sandy ridge. The islet is surrounded by a reef to the distance of 300 yards in places, with some rocks above water on it.

It was reported (1964) that Pulo Pandang is a good radar target at 25 miles distant.

A small breakwater has been built on the east side of the island, forming a boat harbor with a depth of 2 feet.

Light.—A light is shown on the summit of Pulo Pandang.

Landing.—The best landing place, when there is no northwesterly swell, is on the small beach in the middle of the west side of the northern portion of the islet.

Water collects in a pit near the landing place during rains.

Anchorage.—On the ridge extending southeastward of the islet a depth of 7 fathoms will be found at about 1,200 yards from it, but the holding ground is bad and the sides of the ridge steep-to.

Anchorage, however, may be obtained southeastward or northwestward of the islet in 14 to 16 fathoms, mud and sand, with the islet distant about 1,400 to 1,600 yards in both cases. On either side of these ridges, of which the islet forms the center, there are depths of 22 to 25 fathoms.

Near the ridge connecting the two portions of the islet is a small creek where a boat may anchor.

Discolored water was reported (1955) about 8¼ miles eastward of Pulo Pandang.

5–66 Pulo Salanama (Salahnama), or South Brother, lies about 5 miles south-

southwestward from Pulo Pandang, and about 10 miles from Tanjung Timbun Tulang, on the coast. It is about 800 yards in length and 300 yards in breadth, and the tops of its trees attain a height of 300 feet. The island is densely wooded with trees and ferns, and its rocky sides rise steeply from the sea.

It was reported (1964) that Pulo Salanama was a good radar target at 20 miles distant.

A rock 26 feet high lies about 300 yards northward of the islet; at about 200 yards southeastward of it is a rock dry at low water. A rock 39 feet high is located 900 yards east-southeastward from the south point of Salanama; beyond the distance of 200 yards the islet and rocks are free from danger.

Landing.—A small beach, covered at high water, on the southeast side, offers the most practicable landing.

Anchorage.—Temporary anchorage, in from 13 to 14 fathoms, will be found on the southeast and northwest sides of the islet at a distance of about 1,400 yards, in the latter case with the highest part of the island bearing about 135°. The islet affords no fresh water.

Tidal currents.—Near Pulo Pandang the flood and ebb currents set southeastward and northwestward, respectively.

5–67 **COAST—General remarks** *(H. O. Chart 3740).*—The character of the coast between Tanjung Tanjung and Asahan River is similar to that described in section 5-73; it is without exception low and covered with vegetation. The Brothers, in the offing, the mouths of the Batu Bara and Asahan, which are lighted and beaconed, and Tanjung Tanjung and Timbun Tulang, when near the coast, are the only objects readily identified.

Fishing stakes may be found as far offshore as a depth of 5 fathoms.

Aspect.—From 45 to 50 miles within the coast the Batak Mountains extend in a southeasterly direction until abreast or southwestward of Panei River, eastward of which there is no further trace of mountains to be seen from the offing. The most noticeable are a broad mountain ridge within Batu Bara with two flat summits, about 7,050 and 7,200 feet high, respectively, eastward of which is a conical peak 7,054 feet high and here the range terminates. Nearer the coast is a noticeable sharp peak 5,709 feet high, eastward of which the height of the range increases in the Asahan Range.

5–68 **Mount Surungan** *(2°27′ N., 99°21′ E.)*, 7,250 feet high, is the highest and the most southeasterly peak of the Asahan Range; it is fairly sharp, sloping on the west and precipitous on the eastern side. Nearer the coast is a noticeable sharp peak 5,906 feet high, eastward of which the height of the range increases to the Asahan Range.

Kualu Range.—At 17 miles southward of Surungan is the highest point of the Kuala Range; it is very noticeable, being conical and 7,677 feet high. A little eastward is a sharp-sided hummock 6,988 feet high, conspicuous when bearing about south; southeastward of it is a conical peak 6,922 feet high.

Sigumpulan (Bila) Range *(2°05′ N., 99°30′ E.)* has some flat tops. The highest peak is 6,496 feet and the two others are 6,200 and 6,130 feet high.

The peaks of the Asahan, Kuala, and Sigumpulan Ranges may be seen in clear weather as far southeastward as off the Sungi Rokan. They are usually visible in the early morning, but less so in the months of February to May than in the other months of the year.

5–69 **Coast.**—Between Tanjung Tanjung and Sungi Batu Bara, a distance of 9½ miles, the coast is fronted by a white sandy beach

for the whole distance, with the exception of the bank of mud and mangroves northward of the Sungi Gambus.

The bank, which dries offshore for a distance of 1,000 yards or more in places, is generally firm mud mixed with sand, and may everywhere be approached by the lead, but the northeastern edge of the bank off Tanjung Timbun Tulang is somewhat steep-to. The bottom consists of mud, sand, shells, rock, and coral; the two last named being found chiefly near the land.

The Gambus, Perupuk, and Telok Piai are only available for very small trading craft or boats, the mouths being all dry at low water. A few huts are visible from seaward, near the Gambus and Perupuk.

5-70 SUNGI BATU BARA is the common mouth of the Sungi Kanan and Sungi Kiri, two streams which connect at the settlement of Tanjung Tirem, about 1,200 yards above the entrance—which dries about 6 inches. An obstruction lies about 1 mile north-northwestward of the entrance. The anchorage space is scanty near the settlement. On the eastern side of the channel the shore bank dries off about 1,600 yards. Vessels of 8 feet draft can enter at high water, spring tides.

TIDES.—It is high water, full and change, of the semidiurnal tides, in Sungi Batu Bara, at 4 hours; springs rise 7 feet, neaps 2 1/2 feet; the tides are subject to irregularities.

FISHING STAKES are placed in depths of about 4 fathoms about 3 1/2 miles northward of the entrance.

5-71 SETTLEMENTS.—Tanjung Tirem is chiefly inhabited by Chinese, and has a customhouse. The controller of the district lives at Labuan Ruku, a short distance inland, which place is connected by a good road with Bedagei and by another to Tanjung Balei and the Sungi Asahan.

COMMUNICATION.—There is regular communication by steamers with Penang, and some traffic is done by small coasting steamers.

5-72 COAST.—Between Sungi Batu Bara and Timbun Tulang, 10 miles eastward, the sandy beach forming the coast is here and there interrupted by mud and mangroves, the whole backed by trees of uniform height. Some unimportant streams discharged here, among which are the Bagan Batak, 6 miles eastward of Batu Bara, and the Timbun Tulang, at 1,000 yards westward of the point of that name; their mouths dry at low water; farther eastward the coast is uninhabited.

TANJUNG TIMBUN TULANG (Tambuntulang) is low and wooded, and at the mouth of Sungi Timbun Tulang there is a fishing village, visible from seaward from a distance of about 10 miles, which serves to distinguish the point. The shore bank off this part of the coast dries at nearly 1,000 yards on an average.

TIMBUN TULANG BANK extends north-northwestward for a distance of 5 4/5 miles from the point and in a northeasterly direction for 4 1/2 miles, with depths of 1 to 3 fathoms. Four wrecks, partly above water or with masts showing, lie sunk on Timbun Tulang Bank.

DIRECTIONS FOR CLEARING.—Pulo Salanama, bearing 320°, leads 1 mile northeastward of the bank.

FISHING STAKES.—There are fishing stakes, in depths of 3 to 4 fathoms to the westward of the extremity of the bank and 4 miles from the shore; also southeastward of the bank, as charted.

5-73 COAST.—From Tanjung Timbun Tulang to Sungi Asahan the coast, chiefly composed of mud and mangroves, is fronted by a bank which dries off about 1,000 yards.

The Silau Laut, a creek, discharges about 3 1/2 miles southeastward of Tanjung Timbun Tulang.

SUNGI ASAHAN—BAR (3° 02′ N., 99° 52′ E.).—Sungi Asahan, located 7 miles southeastward of Sungi Silau Laut, is 1,000 yards wide at its entrance between Tanjung Napal and Tanjung Djumpul both low mangrove points. The direct and buoyed channel over the western part of the Djumpul Bank fronting the shore of the entrance to Sungi Asahan has a minimum depth of 3 feet at low water and 13 feet at high water, spring tides, over hard sand.

The west channel with a least depth of 2 feet (1957), lies between the west edge of Djumpul Bank and the shore northward of Tanjung Napal; the two channels meet abreast the white buoy off that point; both sides of the western channel are marked by stakes, which are sufficient guide for those acquainted with it.

The depths in the river above Tanjung Napal are from 1 to 3 fathoms, but there are places with only a depth of 3 feet at low water going up to the settlement. The navigation of the river is much restricted by a number of hard sandy shoals.

In 1939 the least depth in the channel above Baganasahan (Bagan) to the wharf at Telok Nibung was about 3 feet and between Telok Nibung and Tanjung Balai about 1 foot. The channels within the entrance are constantly changing in depth and direction.

It was reported (1944) that dredging operations had been under way on Sungi Asahan, from the sea entrance to Telok Nibung, for nearly a year.

According to the latest survey there is a depth of 1 foot in the river abreast Bayan disused light structure.

5-74 DJUMPUL BANK is steep-to, and should be given a wide berth, in not less than 12 fathoms; its edge is usually marked by discolored water. The bank dries for a considerable distance northward of Tanjung Djumpul, and still farther out there is but little water and it dries in places.

Fishing inclosures are erected on the banks and in places close to the buoyed channel; the northernmost is in about 4 fathoms, on the east side of the entrance of the buoyed channel. Some of these enclosures are marked by reflectors.

An unofficial beacon, painted black, with a red cylindrical topmark, is located on the east side of the channel about 1/2 mile northeastward of Tanjung Napal. A red buoy is moored close southwestward of this beacon. A beacon stands half a mile northward of both entrance points of the river.

A black conical buoy is moored on the west side of the fairway about 1 1/2 miles southward of Tanjung Napal.

A black beacon with a diamond-shaped topmark is located on Tanjung Napal.

ASAHAN FAIRWAY LIGHTED BUOY, painted in black and white vertical stripes, is moored about 9 miles northward of Tanjung Napal. Since the channel is constantly changing local knowledge is necessary.

BEACON LIGHTS.—Leading beacons for the several reaches, from which lights are exhibited, indicate the fairway of the river between the mouth and Tanjung Balai. The front beacons show red lights and the rear beacons white lights. In 1963, some of these beacons had been removed. The upper river is marked by several red lights.

5-75 TIDES.—It is high water, full and change, in the entrance at about 4 hours; springs rise about 10 feet, neaps 3 feet; the spring tide rises 1 foot higher in the second half of March and September and 1 foot less in the second half of June and December. At the settlement the spring rise is 1 foot less and the time about half an hour later.

TIDAL CURRENTS.—Outside the bar the flood runs from southeast to south-southeast at the rate of 1 1/2 knots, and the ebb north-northwestward and more northerly attaining a rate of 2 knots. During neap tides the currents are weak and irregular and overcome by the river current. Near the outer buoy the ebb sets northwest and flood southeastward.

The flood makes in the entrance at 5 hours before high water and the ebb at about 6 hours later; the flood attains a rate of 1 1/2 knots and the ebb 3 knots at springs increased by freshets.

There is a tide gauge at Telok Nibung.

5-76 DIRECTIONS.—These directions for the river should only be used by the smallest of vessels, and only when the services of a pilot are not obtainable. Coming from the westward Pulo Salanama should be kept bearing about 313° astern, to pass northward of Timbun Tulang Bank, until the fishing huts on the point of that name bear 230°, when, if entering by the buoyed channel, the outer fishing stakes, in about 4 fathoms, on the northern end of Djumpul Bank and on the eastern side of the channel, should be steered for.

To navigate the channel steer for the outer buoy after bringing the river mouth to bear 191°, after which the channel must be steered through by sight with due attention to the buoys.

Local knowledge is necessary above the disused lighthouse, and the service of a person acquainted with the river could possibly be obtained from Kampung Besar, the fishing village near the disused lighthouse.

Coming from the eastward Tanjung Timbun Tulang should be kept bearing westward of 278°, which leads northward of Djumpul Bank, until abreast the northernmost fishing stakes at the northern extremity of Djumpul Bank, whence course should be altered to about 191° as before.

5-77 SETTLEMENT.—Tanjung Balei (Balai), the chief town of the district of Asahan and residence of the controller, is situated about 7 miles above the mouth of the Asahan at the junction of that river with the Silau. The river here is about 400 yards wide, with low-water depths of from 7 to 10 feet but it is very shallow just above. Industries include three large saw mills, three copra mills, a rubber remilling mill, and several small boatyards capable of building about two 3-ton vessels per month. It was reported (1960) that a boatyard capable of building one 50-ton vessel per month was under construction. The population of Tanjung Balei was about 25,000 in 1960.

PIER.—Small coasting craft could lie alongside the iron pier, about 260 feet long, in depths of 4 1/2 feet (1950).

Telok Nibung, about 4 miles below Tanjung Balei, is a railroad terminus and there is a wharf 330 feet long with depths in 1950 of 18 feet alongside. A pier, 138 feet long, and

with a least depth of 14 feet alongside, is located close westward of the wharf.

COMMUNICATION.—Vessels running between Singapore and Deli visit this port and there is also frequent and regular communication by small steamers with Penang, which come up to the settlement, there is a post and telegraph station.

The road, some 160 miles in length, connecting the several settlements, begins here and ends at Pankalan Brandan. There is further communication by the numerous creeks. Rice, tobacco, and copra are exported, principally to Deli and Penang.

5-78 COAST (H.O. Chart 3740).—From Tanjung Djumpul, the east point of entrance to Sungi Asahan, the coast trends southeastward for a distance of 8 miles to Tanjung Siapiapi, fronted by a mud bank, with depths under 1 fathom, to a distance of 5.5 miles off the former and to 1.5 miles off the latter.

Southward of Tanjung Siapiapi the coast forms a shallow bay 20 miles wide between that point and Tanjung Pertandangan. Into this bay the Sungi Kwalu and Sungi Panei discharge their waters, but there are no other streams of any importance.

There are a few fishing huts, but few objects for identifying the coast, which is low and in most places fronted by mangroves similar to those described in section 5-73. The ranges of mountains, about 40 miles inland, are visible in clear weather.

Tanjung Lundam and fishing station, with some rather tall trees lying near it, is situated about 6 miles southeastward of Tanjung Djumpul; between are the Ular, Betul, Undan, and Sarong Alang, very small streams; the latter is the largest and has a village half an hour's journey upstream.

Between Tanjung Ludam and Tanjung Siapiapi is the Sungi Sembilan, which may be known by the white beach and fishing huts at its mouth.

5-79 TANJUNG SIAPIAPI (02°56'N., 100° 00'E.) is a sharp well-defined point overgrown with mangrove trees of moderate height, and is clearly distinguishable up to a distance of 10 miles on southeast and westerly bearings. The Siapiapi, a very small stream, discharges here, and is marked by two huts at its mouth and a white beach southward of it. The mud bank southward of it stretches off about 2.3 miles, and is steep-to.

WRECKS are reported to lie, respectively, 4 miles northward and 18 1/2 miles eastward of Tanjung Siapiapi.

A CONICAL BUOY, painted in red and white vertical stripes, with a red St. Andrew's cross topmark is located about 7 miles eastsoutheastward of Tanjung Siapiapi.

SUNGIS KOEALOE AND PANEL APPROACHES.—The approach to these rivers lies between Tanjungs Siapiapi and Pertandangan, and is about 20 miles across. It is much encumbered with banks, dry in places, formed by the deposits from these rivers, but there are deep channels between leading to the mouths of the rivers, one of which, West Channel, leading to the Panei, is partly buoyed.

Fishing inclosures are erected in several places on the banks and on the sides of the channel, useful marks for local craft.

Anchorage may be obtained anywhere outside the banks, according to draft.

PANEI BANK extends 10 miles off the mouth of the Kwalu and Panei, and about 4 miles seaward of a line joining the points of the approach; the bottom is mud, sand, and shells, large portions of it dry at low water, and numerous fishing inclosures are erected on it; being steep-to on its eastern side, it should be approached with caution.

CAUTION.—An extensive area, dangerous on account of mines, lies in the inner approaches to Sungi Kuala and Sungi Panei. Consult H.O. Pub. 110 DAPAC for details.

5-80 COAST—LEDUNG.—From Tanjung Siapiapi the mangrove coast trends southward for 11 miles to Sungi Ledung and Ledung Village, situated on the west side of the entrance to Sungi Kwalu, and marked by a depression in the line of trees. The Ledung has a low-water depth of 2 feet.

A native collector of taxes resides at Ledung village, on the southern side of entrance to the Ledung.

About midway between Tanjung Siapiapi and Sungi Ledung is the Chinese fishing village of Si Mendulang (Simendulang), on the south bank of the stream of that name, where there is a white beach. The village, visible from a considerable distance in the offing, is a useful mark, as elsewhere there is only an occasional hut at the mouths of the several unimportant creeks on this coast.

SUNGI KUALU (Kwalu) discharges in the western corner of the bay, abreast Ledung; it is 2.5 miles wide, but quickly narrows to less than 1 mile at the first bend, and within it is narrow and somewhat tortuous. The channel is not buoyed. The bar, with a depth of 9 feet, lies close off the mud flat fronting the western shore, midway between Tanjung Si Babi (Sibabi) and Tanjung Ledung.

DIRECTIONS.—From the northward Tanjung Ledung, western side of the mouth of Kwalu, should be kept well open off Tanjung Si Babi to avoid the mud bank extending off Tanjung Siapiapi. Course is then set to the south until Tanjung Ledung bears 211°, after which this point is steered for. As soon as the village of Si Mendulang bears 270° change course to 197°.

From the eastward the course should lead about 2 miles northward of the white light buoy on Panei Bank.

Steam launches and small trading craft only visit the river.

5-81 SUNGI PANEI (2°41'N., 100°07'E.).—The mouth of Sungi Panei is about 3 miles wide between Tanjungs Datu and Bangsi, the two low mangrove points forming its entrance, but 10 miles above it is reduced to about 1,235 yards, where it is joined from the westward by Sungi Bilah. Labuan Bilik, the settlement, is situated about 2 miles above the junction, on the eastern bank of the Panei.

It was reported (1958) that Tanjung Datu is a good radar target up to 20 miles distant.

The banks of the river are mangrove up to Tanjung Berombang and are also fringed by a mud bank which narrows to the southward. The banks elsewhere are firm, fairly steep, and overgrown with rather high trees and nipa palms. Coconut trees grow along the banks near the villages, which usually take the names of the creeks on which they are located.

The banks have been washed away in places, with the result that at Sungi Lumut coconut trees are found about 40 yards offshore. There are two drying ridges of hard sand in the middle of the river. The island Lumut, which is overgrown with tall trees, has formed on the eastern ridge. There is also a drying bank at the mouth of Sungi Bila and another eastward of Pulo Kantan, which lies opposite Labuan Bilik.

The least depth between the sea and the settlement is about 6 feet 4 miles above Tanjung Datu.

5-82 CHANNELS.—The mud banks fronting the mouth, with depths of 1 to 3 fathoms, extend about 12 miles northward of the entrance; its outer part is known as Panei Bank, previously described; the Middle Bank, about 5 miles in length, and the bank westward of it are steep-to and dry about 6 feet. Between the banks which dry there are four channels into the river; Panei Channel lies close westward of the Middle Bank and Bangsi Channel eastward of the Middle Bank. West Channel is the only one now in use.

East channel is sometimes used by small craft from the eastward well acquainted

with it. Tanjung Bangsi, bearing 228°, leads to its entrance. The least depth is about 7 feet, but there is as little as 4 feet farther in, abreast Sungi Dua.

WEST (Telok Piai) CHANNEL has a least depth of 8 feet, and is situated close eastward of the mud flat extending northward of Tanjung Perapat; the banks on both sides are steep-to. The channel is buoyed.

5-83 SETTLEMENTS.—The settlement of Labuan (Labuhan) Bilik, the residence of the controller, is situated on marshy and barren land and is of little importance. The people are partly Malay, partly Chinese, chiefly occupied in the fisheries. The native ruler of Panei resides near the settlement. It was reported that before the war 10,000-ton vessels regularly used the harbor at Labuan Bilik.

Labuan Batu is situated on the same bank of the river, about 31 miles above Labuan Bilik.

COMMUNICATION.—Small steamers and coasting craft carry on the trade with other parts of Sumatra and Penang, etc.

MEDICAL.—There is a resident medical officer at Labuan Bilik.

5-84 ANCHORAGE.—The usual anchorage is near the mole of the collector of customs just below the settlement, where, very close inshore, there are depths of 13 to 15 feet, but vessels of that draft would have to moor head and stern.

QUARANTINE.—Pulo Kantan is the quarantine station for Labuan Bilik.

5-85 WINDS–RAIN.—In addition to what has been stated in regard to the prevailing monsoons, etc., in the first chapter in the neighborhood of the Sungi Panei, persistent winds of some strength and duration, especially southeasterly, were more observable. During the surveying operations in the month of May these southeast winds prevailed for several days, the direction by day being more from seaward and at night more from southward, at which time the atmosphere was slightly hazy. Sumatras were less frequent than more to the westward, and their direction more from south than west. Hard squalls from southeast with rain were frequent. The average annual rainfall in the neighborhood is 84.5 ins., falling in 132 days. Rain occurs in all months, September to January being the wettest.

5-86 TIDES.—It is high water 2 days after full and change, at Labuan Bilik at 6 hours, with a mean rise of 11 1/2 feet, and half an hour earlier at the outer light buoy in the approach; neaps occur 2 days after quadrature, with a rise of 5 feet. In the second half of March and September the rise at springs is increased to 13 feet; in the second half of June it is 10 feet.

TIDAL CURRENTS.—The flood and ebb currents run for 5 and 7 hours, respectively, at 2 miles within the entrance, but at Tanjung Lumut and Labuan Bilik the flood runs for 4 hours only and the ebb for 8 hours, the former turning at half an hour after high water by the shore. The flood or southeast-going current, off the entrance makes at about 5 hours before high water, and attains a velocity at springs of 2 1/2 knots, the ebb running 3 1/4 knots. Between the entrance points they run 3 and 4 knots, respectively, and at about 1 knot less in the approach; upriver, off Lumut and Lumba Lumba, both flood and ebb attain a rate of 4 to 4 1/2 knots at springs; near the shore between these places there is a counter-current during the first of the flood. There is very little slack water at springs.

5-87 FISHING STAKES.—There are several fishing inclosures and stakes on the banks on either side.

Bank.—Southward of Tanjung Penipahan the shore bank dries off only about 600 yards, and the 3 and 5 fathom curves, which run close together, are about 2.5 miles offshore until about 2 miles southward of Tanjung Hantu, where a bank 2 miles in length and lying 1.5 miles offshore dries at low water; southward of this the water gradually shoals to the river. There is a strong phosphorescence on the water at night, especially near the shore banks.

Northward of the peninsula forming the eastern side of the river the mud bank, with depths of 1 to 3 fathoms, extends about 20 miles northwestward; between this and the southernmost of the Aroa Islands the depths are irregular, from 3¼ to 8 fathoms, with isolated patches on which the depths are from 2¼ to 2¾ fathoms. There are a number of fishing stakes on this bank, some of which are dangerous at high water, being covered.

Between Tanjungs Belanda and Senebui, 18 miles eastward of it, on the eastern side of the approach to the river, the mud bank dries about 1.5 to 2.5 miles, as charted.

Pulo Senebui, formed by mangroves growing on the mud bank, has a narrow passage between it and the shore which extends the whole distance inside the latter mud bank. There is a small fishing village up the Sungi Raja Berjamu, abreast the gap in the mud flats, which stream is 150 yards wide in the entrance.

The mud bank of this coast is reported to be extending, and the coast should not be approached within a distance of 2.5 miles.

Northward and eastward of Tanjung Senebui are the South Sands, described in section 3–99.

Lights have been established on numerous fishing stakes in the approach to **Bagan-Siapiapi and on fishing stakes to the eastward** of Tanjung Senebui. These lights are semi-permanent in nature but are subject to frequent changes both in characteristics and position.

5–88 **Upper river.**—The Panei is navigable above Labuan Bilik in the dry season for vessels of 6 feet draft as far as Ayer Mera plantation, which can be reached in 11 hours by a vessel making 8 knots on a flood tide. Above this point navigation is impossible. In the rainy season Ratau plantation can be reached. Distance not stated.

Sungi Bila, which joins the Panei below Labuan Bilik, has a depth of 6 feet at low water, spring tides, in the channel between the bank fronting Tanjung Berang Berang Tungal and the bank in the center of its mouth. Si Jawi Jawi is the settlement on the western side, at 2 miles above. There is barely 1 foot of water off the settlement at low-water springs, rendering it inaccessible at that time.

Above the settlement the river is winding and in places shallow, but as the rise of tide is considerable for some distance, about 10 feet, it is available with local knowledge for vessels of light draft.

5–89 **Coast.**—The coast between Tanjung Bangsi, at the mouth of the Sungi Panei, and Tanjung Pertandangan, about 5 miles to the eastward, consists of mud, fringed with mangroves, similar to the coast westward of the Sungi Panei. Between are Bakau and Luwus, small streams, at the mouths of which are a few fishermen's huts. Eastward of Tanjung Bangsi is the conspicuous tree, 207 feet in height, previously referred to.

Tanjung Pertandangan *(2°42′ N., 100°14′ E.)* is a low mangrove point, but well defined when seen from northwestward or southeastward because of its high trees.

Bank.—The mud bank dries offshore for a distance of 2 miles northeastward of Tanjung Pertandangan, but thence to near Tanjung Pechudian, nearly 12 miles south-southeastward, it is less than 1 mile offshore; off Tanjung Pechudian it again extends about 2 miles. From the latter point, a spit, with depths of from 1 to 3 fathoms, extends about 10 miles northward, nearly parallel to the coast, and may be approached by the lead, but off Tanjung Pechudian is somewhat steep-to, and should not be approached under a depth of 7 fathoms.

Sitokan.—From Tanjung Pertandangan to Sitokan Kechil village, a distance of nearly 5 miles, the shore is all mangrove, with the exception of a low-water shelly beach just southward of Tanjung Pertandangan and a similar beach between the Pertandangan and the Keluang, two small streams.

A mangrove islet fronts Sungi Sitokan, and a short distance from the entrance is the village of the same name.

Sitokan Kechil village lies 1.5 miles southward of the Sitokan, and is visible from the offing; southward of it, as far as Sungi Tawar, tall trees stand close to the coast.

Tanjung Pechudian is fringed with mangroves, and as the tall trees backing this coast, when near it, decrease suddenly in height, it may be distinguished from some distance. The mud bank, which dries, extends for a distance of 2 miles off the point, and the water is shallow beyond.

Pechudian Besar and Pechudian Kechil, two small streams, discharge southward of the point and have fishing huts at their mouths and little shelly beaches; southward of the streams the shore is again fringed with mangroves.

Tanjung Penipahan, with village and stream of the same name, lies 4 miles southward of Tanjung Pechudian; the village is visible from some distance in the offing. The mud bank dries off nearly 2 miles between Tanjung Pechudian and this village, decreasing rapidly toward the latter, where it extends 1,000 yards only, and is composed chiefly of sand and shells.

Light Buoy.—A light buoy painted in black and white vertical stripes is moored in 10 fathoms of water about 9½ miles eastward of Tanjung Penipahan, and 25 miles northwestward of Tanjung Belanda.

5–90 Rokan Estuary—Coast.—From Tanjung Penipahan the coast, chiefly composed of mangroves, continues its southeasterly direction, forming the western shore of the estuary of Sungi Rokan, in which are situated the Halang Islets. Several small streams discharge on the coast, but there are no points of recognition beyond Chinese fishermen's huts at the mouths of the Sungis Ular, Tenga, Pasir Limau Kapas, and Andam.

Some coconut trees, the only ones on this coast, point out the position of Pasir Limau Kapas, and are possibly a useful mark when approaching the Rokan Estuary from the westward.

Halang Islets, formed by the growth of the mangroves on the mud banks filling Rokan Estuary, have banks, drying at low water, extending about 4 miles southeastward of them.

Outer (Groot) Halang (Pulo Alang Besar), the northern islet, is 5 miles in length. The banks of this island are overgrown for a distance of about 2 miles to the southeastward, and about 1.5 miles to the northwestward. The growth on the island is higher than that on the banks. Inner Halang is about 4 miles in length; southward of it is Telok Merbau settlement, situated about 5 miles above the entrance of the Sungi Kubu, a small stream on the mainland.

Buoys.—A light buoy, painted black and showing a flashing white light, is moored in a position about 3 1/2 miles westward of the northern extremity of Outer Halang.

A can buoy painted in red and white checkers with a red truncated conical topmark marks the location of a 1-fathom patch. The buoy is moored about 1½ miles southward of the south extremity of Outer Halang.

A conical buoy painted in black and white checkers with a black conical topmark point up, is moored about 1¾ miles west-southwestward of the south extremity of Outer Halang.

A mooring buoy, which marks the former site of the station ship, is moored about 3¾ miles south-southeastward of the southern extremity of Outer Halang.

5–91 A fixed red light is shown from a tower on Inner Halang Island.

Dangers.—A shoal with a least depth of 10 feet is located in 2°27' N., 100°51' E.

A shoal with a least depth of 4 feet is located near the western end of the bank northward of Tanjung Senebui.

A submerged piling, dangerous to shipping, is located about 1 mile westward of the southern extremity of Outer Halang.

A small foul area, consisting of a lost anchor and cable, lies in the fairway southeastward of the anchorage, about 5 miles southeastward of the southeast extremity of Outer Halang.

Fishing stakes.—Within the 3-fathom curve of the bank there are numerous fishing inclosures, and there are many fishing stakes covered at high water.

Anchorage.—From 1,000 yards to 1 mile westward of the flagstaff at Bagan Si Api Api, there are depths of about 7 feet, with a channel of about the same depth running up to Tanjung Leban.

There are several drying patches in the entrance to the river.

There is a customs and a number of loading piers at Bagan Si Api Api.

There is good anchorage in about 20 feet of water in a position about 1 mile northwestward of the mooring buoy, which marks the former site of the relief vessel.

5–92 Sungi Rokan is about 5 miles wide at its entrance between Bagan Si Api Api, the principal settlement, and the western shore. It is reduced to 2½ miles abreast Labuan Tengah, some 9 miles above, and to less than 1 mile at Beting, 8 miles above Labuan Tengah. The shores on both sides are composed of mud and mangroves, and intersected by many small streams.

In the entrance, abreast Inner Halang Island, the low-water depth charted is apparently not more than 2 feet.

The river itself is much encumbered with banks, mostly quicksands, and the channels between them are constantly shifting, rendering navigation hazardous, except to those with local knowledge.

The sandbank off Tanjung Belanda was reported (1945) as extending in a southwesterly direction for about three miles.

Tides.—It is high water, 2 days after full and change, at the town of Bagan Si Api Api, at 8 hours; springs rise 17 feet, neaps about 12 feet, and there are two high waters generally in the 24 hours.

Tidal currents.—The flood runs for 4 hours, and the ebb for 8 hours, at the rate of 5 knots at springs, at which time there is no slack water; the water rises about 4 feet in the first, 5 feet in the second, 5 feet in the third, and 3 feet in the fourth hour. The flood current is weak during neaps. The currents turn at high and low water by the shore.

On the mud flat off the Rokan, during springs, the tidal currents revolve against the hands of a watch; the maximum strength of the currents is from 3 to 4 knots, but nothing definite can be given as to their di-

rection; at springs there is scarcely any slack water. During neaps a north current and a south current are noticeable, of which the first named is the stronger and runs the longer, and two days after the quartering of the moon it is very frequently the only current.

5-93 **Bore.**—From 3 days before until 3 days after full and change, the flood makes as a bore some 3 feet in height and with considerable noise and speed; it is a considerable danger to small trading craft and boats; and these usually wait at Labuan Tengah, 9 miles up, until the bore has passed up. Below Labuan Tengah it is not noticeable beyond a sudden rising of the water and a strong current. Of late years the bore appears to have decreased in force, probably overrated in the first instance.

Winds.—Near and eastward of the Rokan, the winds during the survey were very variable; in April and in November and December northwest winds, with rain, were prevalent, while in July and August the winds for the greater part were between east-southeast and northeast. Sumatras caused a disagreeable sea, which, however, did not last long. In July, during four successive days, a strong southeast wind was experienced. Rain fell in every month, the greatest amounts being generally from October to January.

Directions.—There is no definite channel, as the depths are continually changing. Only small craft with local knowledge should attempt to enter.

5-94 **SETTLEMENTS.—Bagan Si Api Api,** fronting the east shore of the estuary of the Rokan, for a distance of 1¼ miles is surrounded by deep swamps. It is a large fishing center, exporting salted and dried fish. The layout is rectangular with a main street of brick, 20 feet wide, and earth side streets, 33 feet wide, with brick sidewalks. The buildings are mainly timber with corrugated iron roofs, often built on piles over water. In 1956 the population was estimated at 30,000. Water can be obtained here and there is a small hospital with 19 beds. The river is navigable only by launches. There is telegraph communication to Tanah Putih.

The settlement of Labuan Tengah is 9 miles, and that of Tanah Putih on the west bank about 33 miles, above Bagan Si Api Api; a native revenue officer resides at the latter settlement.

Communication.—There is communication by steamers to Asahan Deli, Bengkalis, Siak, and Singapore.

5-95 **Coast** *(H. O. Chart No. 3745).*—Tanjung Senebui is the northeastern extremity of the peninsula separating Sungi Rokan from Selat Rupat, from whence the coast trends southeastward, forming the west side of approach to that strait. The whole of it to Tanjung Ketam is uniformly low and thickly wooded, overgrown with mangrove, the nipa palm, and low brushwood. Behind the border of trees it is morass and entirely without inhabitants. Only near and westward of Tanjung Senebui are signs of life apparent, owing to the fishermen from the Rokan pursuing their calling here.

The eastern side of Tanjung Senebui is fairly steep-to, but to the southeastward, between it and Tanjung Ketam, the shore mud bank dries from 200 to 600 yards offshore.

Off-lying bank.—Between Tanjung Senebui and the fairway of Malacca Strait there are a number of mud banks, some of which dry at low water and break occasionally; they are the continuation southeastward of the South Sands, as far as and southward of Pyramid Shoal. There is a navigable channel along the Sumatra coast used by trading craft, and in 1920 a channel between the banks northward of Pulo Rupat connecting this coast channel with the main channel of Malacca Strait was marked by buoys. The positions of these banks will be best understood by referring to the chart.

The bottom is fairly hard and consists of sand, with here and there a layer of mud; the banks are all steep-to, with deep water between them.

Bakal Tua Bank, within the 5-fathom curve, is 7 miles in length, 11/3 miles in breadth, and steep-to on all sides; it lies parallel to and 1 mile distant from the shore on the western side of entrance to Selat Rupat. The general depths over it are from 1 foot to 6 feet over hard sandy bottom, but two spots on it dry at low water.

Caution.—Shoal depths varying considerably from the charts have been reported in both entrances to the Selat Rupat.

Anchorage.—Good anchorage may be obtained in 6 to 12 fathoms, sand and mud, along the whole of the west shore of the entrance of Selat Rupat and in the channel within Bakal.

5-96 SELAT RUPAT (H.O. Charts 3745 and 3764), the strait separating Pulau Rupat (Roepat) from the coast of Sumatra, is 4 1/2 miles in width at its north entrance and narrows to 2 miles in places; it is a convenient inshore channel for steam coasting craft trading between Singapore and the extensive fishing stations in Sungi Rokan, via Gelam Strait.

A BUOYED SWEPT CHANNEL is located in the east part of the strait (sec. 5-97) which, together with the buoyed swept channel in the northern approach to Selat Bengkalis (sec. 5-101 and 5-102), provides a deep draft channel to Dumai of sufficient depth to accommodate ships up to 50 foot draft. These channels have been swept to a depth of 52 1/2 feet.

Vessels are cautioned that the entrance channel buoys are subject to shifting.

SHORES OF THE STRAIT.—The whole of the southern shore of Selat Rubat is thickly wooded, and there are no streams of any i[redacted] the larg-
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H.O. Chart 3764 (and Plan) (1).
H.O. Pub. 70, 1951, page 165.

DUMAI (Dumai)

cated on the south side of Selat Rupat, [redacted] 18 miles westward of Tanjung Lebang, is an oil port, opened in 1958 to handle the flow of oil from Duri oilfield. In 1961 the population was about 8,000. The terminal has a loading capacity of 33,000 barrels per hour.

A WRECK, swept to 35 feet, and marked by a lighted BUOY on its north side, lies in mid-channel about 1 1/3 miles southeastward of Tanjung Kepal. This buoy is equipped with a radar reflector. A report (1964) indicates the buoy has been removed.

ANCHORAGE.—Anchorage can be taken northward of the port in 43 to 52 feet, clay, good holding ground. A 35-foot patch eastward of the anchorage area is marked by the above wreck light BUOY.

WHARVES.—The Oil Wharf is a T-head wharf with a 420-foot long 16-foot wide approach. The T-head is 150 feet long and 50 feet wide, and connects to a breasting dolphin on each side by means of catwalks. The length of the entire complex is 365 feet. Two mooring dolphins are located on each side of the complex, with the outer of each pair 412 feet from the breasting dolphin on its side. The least depth alongside is 65 feet.

A 450 foot T-head oil wharf with a mooring dolphin off each end is located close eastward of the existing oil wharf.

The Freight Wharf, westward of the Oil Wharf, with a least depth of 36 feet alongside, is 255 feet long and 51 feet wide, and has two approaches—each 340 feet long and 16 feet wide. A mooring dolphin is located on each side of the wharf. This wharf is also equipped to load tankers, with a maximum loading rate of approximately 20,000 barrels per hour.

PILOTAGE.—Pilots are not available. An oil company mooring master boards at the anchorage off Dumai and his services are compulsory.

Minimum draft requirements established by the oil company marine department are:

Foreward	Aft
12 feet	20 feet
15 feet	24 feet
16 feet	26 feet
19 feet	27 feet
22 feet	28 feet

[redacted]SIA—Sumatra—Dumai—Hydrographic information.—1. [redacted] pier (1°41'13" N., 101°27'56" E. approx.) has been reported [redacted] reported that dry cargo vessels do not take a pilot until arrival [redacted]le a pilot will meet tankers at the buoyed channel entrance.

[redacted]ing assistance is pro-
[redacted]p. diesel electric tugs
[redacted] the immediate vicinity
[redacted]e rendering assistance
[redacted]ıe orders of the Com-
[redacted]r. The tugs are fitted
[redacted] monitors to assist in fighting fires. Several mooring launches are also available. Mobile cranes with a maximum lifting capacity of 5 tons are located on the freight wharf. Heavy lifts must be handled by ship's gear.

SUPPLIES.—It was reported (mid-1960) that provisions were not plentiful and difficult to procure.

COMMUNICATIONS.—The government operates a radio station (call letters PKP) at Dumai. All incoming vessels should establish early contact with this station in order to transmit ETA data, etc.

MEDICAL.—There is a small dispensary with a medical orderly in attendance. In emergencies arrangements must be made for a company doctor to meet the vessel on arrival. A hospital, provided by the oil company, is located about 1/2 mile from the port.

The entrance channel is well marked, and is about 2 1/2 miles wide in the vicinity of the Freight Wharf. Its general width is 1 1/2 miles.

SIGNALS.—All vessels inbound to Dumai or Sungaipakning (sec. 5-105) must, from the time abeam of Raleigh Shoal Light Buoy (sec. 3-103) until anchored off Dumai or Sungaipakning, display the following recognition signals:

By day: The International Code Flag hoist "CAL" from a single hoist from the signal yard.

By night: A red light 6 feet above a white, both visible all around the horizon for a distance of not less than 2 miles.

Vessels should be prepared to answer identification queries from Indonesian Naval Patrol Craft.

Tidal signals are shown from the oil wharf at Dumai. Two fixed red lights horizontally disposed indicate east-going current; two fixed white lights horizontally disposed indicate west-going current. Red and white balls in lieu of the lights are used as day signals. The current set follows very closely the natural deepwater channel, with a maximum speed of 3 knots.

The average range of spring tides is approximately 8 feet; the average range of neap tides is approximately 5 1/2 feet.

The coast of Pulo Rupat on the north side of the strait, from its northeast extremity to as far as Tanjung Masim, its southeast extremity, is covered with low trees and brushwood and inundated at high water; within are tall trees with which the entire island, chiefly marsh, is completely overgrown.

Batu Panjang village, the small houses of which are conspicuous, lies 5 1/2 miles westward of Tandjung Tegoh, the southern extremity of Pulau Rupat; elsewhere the coast is uninhabited, but here and there a few huts may be seen, which form the temporary dwelling place of a few Chinese or Malays who come here to cut timber. The small streams are of no importance. The islands in the strait are all covered with tall trees.

5-97 DEPTHS—DIRECTIONS.—The depths vary in the channels between the banks, and between them and the shores on either side; southward of Pulo Ketam the channel over another bar has depth of 3 1/2 fathoms, and the straits should not be used without having local knowledge.

The channel generally used by coasting craft from Sungi Rokan is along the Sumatra coast for the whole distance, from Tanjung Senebui, at the northwest approach, to Tanjung Lebang, at the east entrance, and westward of all the islands in the strait. The least depths are 4 3/4 fathoms on the bar connecting the south end of the Bakal Tua Bank and the Sumatra shore, and 2 1/2 fathoms on the bar connecting the south end of Pulo Ketam with the same shore.

Southward of Pulo Ketam are the islands of Atong, Pajung, Rampang, Jentileth, and Mampu; in the channel between the last island and the Sumatra coast, there are depths of from 13 to 22 fathoms, and both sides are steep.

In the channel between Pulo Rupat and Pulo Pajung, there is at least 6 fathoms in the north end; the south end is narrowed by shoals on either side, but a least depth of 4 3/4 fathoms is charted.

From the bar at the south end of Pulo Ketam to Selat Bengkalis the least navigable depth is 7 1/2 fathoms.

A narrow shoal, which dries in its east part and which has general depths of 1 foot to 3 fathoms, lies in the east part of the strait. The shoal extends up to 1 mile off the south shore of Pulo Rupat between Tanjung Tegoh and Batu Panjang village.

Shoal ground, as defined by the 5-fathom curve, extends up to 1 1/2 miles off the Sumatra coast eastward and westward of Puak village.

A lighted buoy "BR", equipped with a radar reflector, painted in black and white bands, marks the junction of Selat Rupat and Selat Bengkalis. It is moored about 5 miles southwestward of Tanjung Djati and about 2 miles eastward of Tunjung Bakaw.

From the junction point of Selat Rupat and Selat Bengkalis a channel, swept to a depth of 52 1/2 feet and marked by lighted buoys, leads for about 32 miles to the oil loading terminal at Dumai. Each of the channel buoys is equipped with a radar reflector and is painted, marked, and lighted in accordance with the Indonesian buoyage system (sec. 1-38).

Within the depth of 5 fathoms the shore banks are mostly steep-to, and the bottom consists chiefly of mud and sand, with hard clay in places anchorage may be taken everywhere.

5-98 TIDES.—The tides are semidiurnal, and the highest water is from one to two days after full and change of the moon.

It is high water full and change in the western entrance of Selat Rupat at about 5 hours 45 minutes; southward of the island at about 6 hours; and at Tanjung Lebang, in the eastern entrance, at 6 hours 30 minutes. Springs rise about 12 feet in the western entrance and from 8 to 9 feet in the eastern entrance.

TIDAL CURRENTS.—In the strait the flood current sets southeast and the ebb current northwest; in the eastern entrance to the strait the flood sets east-southeast and the ebb west-northwest southward of the island; in the strait by Dumai village, the ebb current runs from 7 to 8 hours and the flood from 4 to 5 hours at full and change, the greatest rate of the former being 3 knots and of the latter 2 knots; at the entrance of the strait the rate is about 2 knots.

5-99 PULO RUPAT AND MEDANG, lying northward of Selat Rupat, are separated by Selat Morong, a tortuous strait about 200 yards wide with depth of more than 5 fathoms, but it is of no importance to navigation. Its eastern entrance has a low-water depth of 6 feet, and its western entrance 3 feet over a flat 1 mile wide. Both shores are thickly overgrown, and there are no inhabitants.

Together the two islands are nearly circular in shape, about 26 miles in diameter, and the greater portion of them is morass with mangrove shores and tall trees within, the tops of which are visible from a distance of about 16 miles. Pulo Rupat, with the exception of its northwestern extremity, has been described with Selat Rupat.

A stream discharging on the northwestern side of Pulo Rupat, is 400 yards in breadth and has a depth of 2 1/4 fathoms in its entrance, but it is blocked by the mud flat in its approach, upon which there is a depth only of from 2 to 3 feet. Between the river mouth and the cape at the entrance of Selat Rupat the coast is overgrown with trees to the high-water line.

5-100 PULO MEDANG.—The greater portion of Medang is low and wooded close down to the shore, which is composed chiefly of mangroves; on the northeastern side there are some sandy beaches, casuarina trees, and several small villages. There is a hut on the cape located about 3 1/2 miles southeastward of the north extremity of the island. Small fishing settlements are located on some of the islands off the northwest shores of Pulo Medang.

Beyond the distance of 1 mile the northeastern coast is clear of dangers, with the exception of the bank, nearly dry at low water, which extends about 1 4/5 miles off shore about midway along the northeast coast of Pulo Medang. The banks northwestward of the island, the continuation southward of South Sands, will be best understood by referring to the chart.

TIDES.—Off Tanjung Medang it is high water, full and change, at 6 hours; springs rise 8 feet. Off the eastern entrance to Selat Morong it is high water, full and change, at 6 hours 30 minutes; springs rise about 8 feet.

TIDAL CURRENTS.—Northward of Pulo Medang the flood current setting from east-southeast to east, runs at the rate of 2 knots, and the ebb, setting from northwest to west, at about 3 1/2 knots; at neaps there is little or no southeast or flood current appreciable. On the eastern coast of Pulo Rupat the flood current sets more to the southward, along the land, and the ebb in a more northerly direction with rates of 1 1/2 and 2 knots, respectively.

5-101 SELAT BENGKALIS—DEPTHS (H.O. Chart 3745 and 3764).—The approach from the northward to Selat Bengkalis presents no great difficulty provided the buoys are in their proper positions. The water is deep, as below mentioned. The entrance, between Pulo Rupat and Pulo Bengkalis, is 18 1/4 miles wide, and between the banks extending from both those islands there is a channel from 1 3/4 to 3 3/4 miles in width, with depths of from 8 to 15 fathoms, and over a breadth of about 3 1/2 miles there is not less depths than from 2 1/2 to 3 fathoms at low water. In 1963 there was a swept depth of 52 1/2 feet in the fairway from the entrance to Sungaipakning.

At about 17 miles within Tanjong Djati is Selat Padang, on the eastern side, leading out to Malacca Strait.

Beyond Tanjung Balai (1° 23′ N., 102° 09′ 30″ E.), Selat Bengkalis is known as Selat Panjang (Lalang), leading southward of Pulo Padang and Pulo Tebing Tingi, and is deep for about 60 miles, beyond which there are islets and shoals encumbering the strait. Selat Panjang (Lalang) is described in section 5-115.

Sungi Siak branches off from the west shore about 9 miles within Tanjung Balai.

BANKS.—On the west shore, from abreast the entrance to Selat Morong, a bank with depths of from 2 to 3 fathoms takes a general south-southeast direction for about 13 miles, its south extremity lying about 8 1/2 miles in an easterly direction from Tanjung Masim, its outer edge marked by a light-buoy, whence it turns directly westward for Tanjung Tegoh, the north side of Selat Rupat. Southward of it are the shoals mentioned with Selat Rupat.

A detached shoal, which dries 4 feet, lies about 1 1/2 miles southward of Tanjung Masim.

A number of shoals having patches with depths of from 2 to 5 fathoms extends about 18 miles northward of Tanjong Djati, the eastern point of entrance, and 10 miles from that point they are up to 15 miles in breadth east and west; two patches with depths of 2 1/2 fathoms of water over them lie near the channel edge about 5 miles northwestward of the point, with other patches of 3 3/4 to 4 1/4 fathoms extending along the same edge for about 7 1/2 miles northward of them.

Patches of 3 1/2 fathoms lie 3 miles westward of Tanjung Djati.

LIGHTS—BUOYS.—The approach light buoy for Selat Bengkalis is located about 13 1/4 miles southward of Raleigh Shoal (sec. 3-103) and about 11 miles westward of Rob Roy Bank Light (sec. 3-103). It is painted in red and white vertical stripes and is equipped with a radar reflector.

Light Buoy No. 1 painted black, and equipped with a radar reflector, is moored on the west side of the entrance channel about 4 3/4 miles south-southwestward of the entrance approach light buoy.

Light Buoy No. 3, located about 11 miles northwestward of Tanjung Djati, and Light Buoy No. 5, about 5 miles westward of the same point, mark the west side of the north entrance channel leading to Selat Bengkalis. Both of the above light buoys are equipped with a radar reflector.

Selat Bengkalis Light is shown from an iron skeleton structure with a white hut painted in black and white horizontal bands on the seaward side, and painted black on the shoreward side, and is located about 9 1/2 miles 287° from Tanjung Djati.

WRECK.—A dangerous wreck lies about 2 1/2 miles northward of Selat Bengkalis Light.

A light is shown from a flagstaff on the head of the customs pier at Bengkalis.

On the east side of the channel at the junction of Selat Padang and Selat Bengkalis is a lighted buoy, painted red. It marks the west end of a shoal.

A light is shown from Tanjong Balai.

Two lighted buoys, mark the north and south ends of a shoal area with a least depth of 24 feet. The northern buoy, spherical in shape and painted red, lies about 2 1/2 miles south-southeastward of Tanjung Balai light; the southern buoy, spherical in shape and painted black, is 2 2/3 miles farther south-southeastward.

A 33-foot SHOAL lies in the fairway southward of Sungai Pakning about 1 1/2 miles southward of the south buoy.

A steel framework mast, painted red and white and 328 feet high, is located at the radio station almost 1/2 mile westward of the dock at Sungsipakning. Three red lights are shown vertically, the uppermost light marking the truck. The lowest light is obscured in places.

A white mooring buoy is located a little over 1 mile east-southeastward of the radio mast at Sungaipakning.

Additional lights and buoys, for the position of which, see the latest chart and consult the latest Notices to Mariners, are placed to aid in the navigation of Selat Bengkalis.

CAUTION.—It was reported (1960) that the characteristics and positions of some of the buoys in Selat Bengkalis are not as charted.

5-102 The west shore of the approach, on which there is but little noticeable southward of Selat Morang, has been previously mentioned, and Pulo Bengkalis, on the eastern side, will be described with the island later; the coast of that island as seen from the strait is of uniform appearance and completely covered with trees and brushwood.

From Tanjong Djati, the eastern point of entrance, for a distance of about 20 miles eastward, the northern coast of Pulo Bengkalis is fronted by shallow ridges parallel to the shore and having generally deeper water between them; they present no danger to small vessels.

A bank with 2 1/4 fathoms least water lies 6 1/2 miles northward of Bantan Tengah village. During the fishing season, for about two weeks in the months of May and November, there may be as many as five or six hundred small craft engaged here in fishing.

DIRECTIONS.—The approach from northwestward is along the northeast coast of Pulo Medang. At a distance of 2 miles offshore, and beyond, there are depths above 10 fathoms. From eastward, a vessel may pass on either side of Rob Roy Bank (sec. 3-103) according to draft.

From a position about 1 mile west of SELAT BENGKALIS APPROACH LIGHT BUOY (approx. pos. 1°53.5'N., 101°52.5'E.) follow the swept channel for about 14 miles to a position about 2 1/4 miles east of Selat Bengkalis light and thence for about 9 miles to a position about 1/2 miles east of the Selat Rupat-Selat Bengkalis junction buoy located about 2 miles eastward of Tanjung Bakaw. From this position a course may be shaped southeastward in Selat Bengkalis or westward to enter the swept channel into Selat Rupat.

A vessel from eastward may, if draft permits, and with sufficient local knowledge, enter the southeast end of Selat Bengkalis by Selat Padang, passing southward of Pulo Bengkalis.

5-103 PULO BENGKALIS is 38 miles in length, in a northwest and southeast direction, and 11 miles in breadth at its widest part, and from Tanjong Djati, the western extremity, to Tanjung Parit, the northeast point, the north coast trending in an easterly direction for 29 miles, is wooded and has a generally monotonous appearance; midway between thesepoints on the northern coast is Bantan Tengah village, already mentioned.

From Tanjung Parit (1°31'N., 102°27'E.) the coast has a southeast direction for 4 miles to Tanjung Sedekip and then turns to the southward for 13 miles to Sekudi village, north side of the east entrance to Selat Padang; it is fronted by a bank of sand and mud, extending about 600 yards from the shore and is steep-to.

Sungi Kembung discharges southward of Tanjung Sedekip, although for some distance inside there are depths of from 3 to 7 fathoms, there is only a depth of 3 feet on the bar, the entrance being 200 yards in breadth.

Sekudi village, located near the southeast point, consists of a few small houses; from this point a spit of less than 3 fathoms, a small portion of which dries, extends in a southerly direction for a distance of about 1,600 yards, and a depth of 17 feet lies a little over 1 mile south-southeastward of the point.

Information concerning the aid located on this spit is given with Selat Padang in section 5-114.

DEPTHS OFFSHORE.—Between the eastern coast of Bengkalis and the Long Bank in Malacca Strait are a number of narrow sand ridges, following the trend of the coast and channel, with least depths of about 2 fathoms.

5-104 ANCHORAGE.—Anchorage may be obtained from 200 to 300 yards off the pier, in 5 to 6 fathoms, mud. It is recommended to moor.

A WRECK, the position of which is doubtful, lies about 1/2 mile southeastward of the light structure on the Custom Pier at Bengkalis.

TIDES.—It is high water, full and change, at Tanjong Djati at 7 hours 15 minutes; on the north coast of Pulo Bengkalis Tanjung at 8 hours; on the east coast at 9 hours 30 minutes; the mean range is 5.6 feet and the spring range is 7.8 feet. The highest water occurs from 2 to 3 days after full and change.

TIDAL CURRENTS.—In the straits between the islands, as outside, the flood current sets to the southeastward and ebb to the northwestward, the latter being almost always the stronger. At neaps both the flood and ebb currents are weak off Pulo Bengkalis. Off the east coast the flood currents attain a rate of 2 knots and the ebb current 3 knots.

5-105 BENGKALIS (1°28'N., 102°06'E., H. O. Chart 3764).—On the northern side of

Selat Bengkalis, about 11 miles southeastward of Tanjong Djati, is Bengkalis settlement. An assistant resident is the head of the government, and the inhabitants are principally Chinese and a few Mohammedans.

In May and November there is considerable activity around these islands for a couple of weeks, when hundreds of craft are engaged in the fishing for trubuk, a species of shad, whose spawn is a valuable commercial article greatly sought after by the whole archipelago.

WHARVES.—There are two T-headed piers at Bengkalis. The head of Government pier, the more southeastward of the two, is about 33 feet long and, in 1955, was nearly dry. The head of the commercial pier is about 98 feet long and had a depth of 13 feet alongside.

COMMUNICATION.—There is regular communication by steamer with other ports on the coast of Sumatra.

SUNGAIPAKNING (Songaipakning) is a small oil terminal located about 7 miles south-southeastward of Bengkalis. Wharf No. 2, an offshore wharf, capable of berthing one 85,000-ton tanker, or two 50,000-ton tankers simultaneously, is located about 535 yards offshore. The wharf is of steel pile construction, with a central loading platform 180 feet long and 40 feet wide. Flanking mooring platforms are connected to the central platform by walkway bridges 104 feet long. Isolated mooring dolphins are located northward and southward of the flanking dolphins. The depth alongside is about 60 feet. It was reported (1960) that an 855-foot long tanker, drawing 46 feet, loaded 84,000 tons of crude oil in 30 hours at this berth. Two 2 1/2-ton cranes stand on the wharf. The north and south ends of the wharf are marked by LIGHTS.

About 1/2 mile northward of Wharf No. 2 lies Wharf No. 1, capable of accommodating tankers of up to 84,000 tons. This is a modified T-head wharf, 1,000 feet long, with a least depth of 48 feet alongside, and connected to the shore by a 700-foot causeway. In all other essential respects it is similar to Wharf No. 2. A light is shown from the north end of Wharf No. 1.

There is also a freight wharf 90 feet long and a town jetty for river craft..

Pilots will meet vessels at the anchorage. Customs and other officials usually board at the dock.

Harbor and port facilities include one tug of 1,750 hp., three smaller tugs, 15 barges, and about 3,600 square feet of covered storage. Provisions and water are available.

The recommended anchorage is in an area about one mile northeastward of the oil terminal in about 11 fathoms, clay, good holding ground.

The current floods in a southerly direction at a maximum rate of 3.5 knots and ebbs in a northerly direction at a maximum rate of 2.5 knots. The general direction of the current is parallel to the face of the wharves.

The maximum spring range of tide is about 10 feet.

No docking is done at night, but a vessel may leave the terminal at any time.

A radio station is maintained here.

For signals to be shown by inbound vessels see section 5-96.

In mid-1963 the terminal facilities at Sungaipakning were in an inactive status.

5-106 BUKIT BATU ANCHORAGE.—Anchorage may be obtained abreast of the river, in 12 fathoms at about 1 mile offshore.

5-107 BUKIT BATU is a village built on piles, located on the Sumatra shore of Selat Bengkalis, at the mouth of a small river of the same name, 6 miles westward of Bengkalis.

5-108 SUNGI SIAK (1°14'N., 102°10'E., H. O. Chart 3745), entering Selat Panjang (Lalang) at about 9 miles southward of Tanjung Balai, in Selat Bengkalis, is about 1,000 yards