

Karimata Eilanden, is mountainous with a steep and rocky coast. Its highest peak, 1,575 feet high, is near the center of the island, and is visible at times at a distance of 32 miles. A few reefs extend a short distance from the points along the coast of this island. The small inlets are foul because of submerged rocks and reefs. The small rocky peninsula forming the northwestern extremity of this island resembles an islet when seen from the west. The island is uninhabited except for the lighthouse keepers.

**Poelau Seroetoe Light** is shown from a white iron skeleton structure, 82 feet high, situated on a hill near the western extremity of the island.

In 1961, a local magnetic anomaly causing an increase of up to 2°E. over the normal variation was reported to exist between positions 17 miles westward and 13 miles southward of Seroetoe Light.

clouds. The only village on the island is situated on the southeastern coast and is inhabited by a few woodcutters. Tandjoeng Regeh is a point forming the western extremity of Poelau Karimata.

During the northwest monsoon there is good **anchorage**, in depths of 6 to 8 fathoms, about 4 miles east-southeastward of Tandjoeng Doengoe; this anchorage can be approached only from the south. During the southeast monsoon there is good **anchorage**, in depths of from 11 to 14 fathoms, about 2 1/4 miles westward of Tandjoeng Senna, the northern extremity of Poelau Karimata. In the area westward of Tandjoeng Senna vessels should not proceed farther southward than the alignment of Tandjoeng Senna with the southern extremity of Poelau Boean, a bearing of 079°, because of the reefs in the bay southwestward of Tandjoeng Senna.

**7-56 Off-lying islets.**—Begoenoeng, 1,294 feet high, is an islet which lies about 1/2 mile westward



POELAU SEROETOE BEARING 093°, 9 MILES

**7-55 Poelau Karimata** is the largest island of the Karimata Eilanden and lies about 3 3/4 miles northeastward of Poelau Seroetoe. Between Poelau Seroetoe and Poelau Karimata there is a deep navigable passage which has a width of about 2 1/2 miles between the 6-fathom curves. The eastern side of this passage is formed by a ridge of sand which extends about 5 miles southward from Tandjoeng Doengoe, the southern extremity of Poelau Karimata. There is a depth of 1/2 fathom about 1 1/2 miles south-southwestward of Tandjoeng Doengoe. Goenoeng Tjabang, 3,379 feet high, is the highest peak on Poelau Karimata and is situated near the center of the island. This peak is visible at a distance of 48 miles in clear weather, but it is often enveloped in

of Tandjoeng Regeh, the western extremity of Poelau Karimata. It is the highest of several islets which lie off Tandjoeng Regeh and is easily distinguished from the sloping hills of Poelau Seroetoe and Poelau Karimata because of its sharp, conical shape. Soeroeng Gading, 787 feet high, and Genting, 187 feet high, are islets which lie about 1 1/4 miles westward and 1/2 mile westward, respectively, of Begoenoeng. Penangis, 69 feet high, and Boeloe, 394 feet high, are islets which lie about 1 1/2 miles northwestward and 1 mile northward, respectively, of Begoenoeng. Kepajang lies about 1/2 mile northward of Tandjoeng Regeh. Boesoeng, 246 feet high, and Blian, 105 feet high, are islets which lie about 1 1/2 miles south-southeastward and 2 miles southward, respectively, of

Begoenoeng. Vessels should not attempt to pass between any of these islets, because the adjacent reefs are very steep and the current is usually strong.

**7-57 Islands and dangers northward and eastward of Poelau Karimata.**—Leman Eilanden and Jamsetjie Rif, northward of Poelau Karimata, are described in sec. 7-92. The reefs and islets eastward of Poelau Karimata are described in sec. 7-91.

**7-58 DANGERS IN THE NORTHERN APPROACH TO STRAAT KARIMATA.**—Most of the reefs and dangers in the north approach to Straat Karimata lie within an area about 5 miles wide which extends northward for a distance of about 14 miles from a position about 33 miles northwestward of Tandjoeng Senna, the north extremity of Poelau Karimata. These reefs and dangers are seldom marked by surf and should be given a wide berth.

Gwalia, a coral reef over which there is a depth of 3 feet, lies about 33 miles northwestward of Tandjoeng Senna, the northern extremity of Poelau Karimata. At times the sea breaks slightly over this reef. Erickson, a reef with a depth of 4 fathoms over it, and Twilight, a reef with a depth of 8 feet over it, lie about  $2\frac{1}{2}$  miles northwestward and 5 miles northeastward, respectively, of Gwalia.

China, a reef with a depth of 3 feet over it, lies about  $8\frac{1}{2}$  miles north-northwestward of Gwalia.

North Greig, a reef with a depth of fathoms over it, lies about 5 miles north-northeastward of China. Middle Greig, a reef with a depth of  $2\frac{3}{4}$  fathoms over it, and South Greig, a reef with a depth of 5 fathoms over it, lie about  $1\frac{3}{4}$  miles south-southwestward and nearly  $3\frac{1}{4}$  miles south-southwestward, respectively, of North Greig.

A steep-to reef ( $0^{\circ}35'$  S.,  $108^{\circ}12'$  E.), with a depth of  $2\frac{3}{4}$  fathoms over it, lies 27 miles northwestward of North Greig. It is treacherously located in the middle of an area of uniform depths and cannot be recognized in any manner.

A dangerous obstruction lies about  $9\frac{1}{2}$  miles west-southwestward of North Greig.

**7-59 DIRECTIONS FOR STRAAT KARIMATA.**—Vessels coming from West Java should steer for Discovery Oostbank H. O. 71

light-structure and then pass eastward of it. They should then steer in a northerly direction until past the Momparang Eilanden. A northwesterly course should then be steered so as to pass between Ontario Rif and Poelau Seroetoe. Vessels coming from East Java should steer for the east side of the south entrance to Straat Karimata and pass westward of Fox Banken, Aruba Banken, and Clemencia Bank. A northwesterly course should then be steered so as to pass between Ontario Rif and Poelau Seroetoe. Note that two submerged wrecks lie about  $17\frac{1}{2}$  miles eastward and about 28 miles east-northeastward, respectively, of Cirencester Klip; note also that several reefs and shoal patches lie within a distance of about  $14\frac{1}{2}$  miles east-southeastward of Cirencester Klip (see sec. 7-50).

Vessels should pass between Ontario Rif and Poelau Seroetoe on a northwesterly course, steering so as to pass Poelau Seroetoe light-structure at a distance of about 5 miles. After passing between Ontario Rif and Poelau Seroetoe, vessels proceeding northward to the China Sea should steer northward approximately along the meridian of  $108^{\circ}$  E., taking care to avoid the reef with a depth of  $2\frac{3}{4}$  fathoms over it lying 27 miles northwestward of North Greig, and steering so as to pass eastward of Poelau Pengiki-besar.

The inshore routes which pass between Poelau Karimata and the western coast of Borneo, used by vessels proceeding to Pontianak or other places on this coast, are described in secs. 7-84 to 7-90.

**7-60 WESTERN COAST OF BORNEO FROM TANDJOENG SAMBAR TO TANDJOENG BERASBASAH.**—From Tandjoeng Sambar to Tandjoeng Berasbasah, about 74 miles north-northwestward, the coast is mostly low and marshy. The rivers which discharge through this section of the coast have sand banks and mud banks at their mouths, so that even shallow-draft vessels can scarcely enter most of them except at high water.

**7-61 Currents.**—Drift currents caused by the northwest monsoon or the southeast monsoon are the predominant currents on and westward of the line joining Clemencia Bank and Poelau Maja, an island about 134 miles northward; these drift currents are affected somewhat by the tidal currents. Eastward of this line and farther inside Bocht Van

Soekadana the diurnal tidal currents predominate to an increasing extent.

The tidal currents close off the coast of Borneo flow in the following directions:

Southward of Tandjoeng Sambar: with a rising tide the current sets west and with a falling tide the current sets between east and southeast.

Between Tandjoeng Sambar and Soekadana: with a rising tide the current sets between north and north-northwest and with a falling tide the current sets between south and south-southeast.

Eastward of North Greig: with a rising tide the current sets south and with a falling tide the current sets north.

Westward of Poelau Maja: with a rising tide the current sets between south and south-southeast and with a falling tide the current sets between north and northwest.

Drift currents caused by the northwest monsoon or the southeast monsoon are the predominant currents among the Karimata Eilanden and eastward as far as the Lajah Eilanden and the Pelapis Eilanden.

The tidal currents predominate between and to the eastward of the Lajah Eilanden and the Pelapis Eilanden. Some parts of this area may have silt deposits at times.

The tidal currents predominate in front of the river mouths northward of Poelau Maja. The monsoon winds have very little effect on the currents in this area.

**7-62 Coast—Islands and dangers.**—Tandjoeng Sambar ( $3^{\circ} 00' S.$ ,  $110^{\circ} 18' E.$ ), the southwest extremity of Borneo, is a sharp, rocky point covered with trees; due west of the south extremity of this point stands a conspicuous, forked tree which looms above the other trees and is visible about 13 miles. Above-water and sunken rocks lie within about  $1\frac{1}{4}$  miles southward and westward of the point.

Poelau Penamboen-besar, an islet about  $5\frac{1}{2}$  miles west-southwestward of Tandjoeng Sambar, has three isolated trees on it, which resemble three small rocks when seen from a distance of 12 miles. Poelau Mangkoet, an islet about  $7\frac{1}{2}$  miles west-southwestward of Tandjoeng Sambar, has one tree near its center which can be seen from a distance of 14 miles. There are numerous rocks around these islets.

The area between Tandjoeng Sambar and Fox

Banken and Clemencia Bank (see sec. 7-52) has many sand ridges recognizable by tidal rips; ships cannot be navigated in this area. A **beacon**, surmounted by two black cones, stands on a drying reef about  $7\frac{1}{2}$  miles south-southwestward of Tandjoeng Sambar. Linge Shoal, with a least depth of  $\frac{3}{4}$  fathom, is situated at about 16 miles southward of the point.

Poelau Gelam (Gelum) is a very low, flat, and densely wooded island about  $1\frac{1}{2}$  miles westward of Tandjoeng Kepala, a point about 8 miles northwestward of Tandjoeng Sambar. This island is difficult to identify from westward, where it appears to be a long, somewhat dark strip of land fronting the coast. Small vessels can anchor in a small bay with a sand beach on the northwestern side of the island; the water is about 3 fathoms deep about  $1\frac{1}{4}$  miles offshore and the bottom is sand. Both exposed and submerged rocks lie off the entrance points of this bay.

Poelau Gambar is about  $2\frac{1}{2}$  miles westward of Poelau Gelam and consists of two rocks standing very close together and covered with vegetation. Poelau Perantoeng, nearly  $3\frac{3}{4}$  miles northward of Poelau Gambar, is a low, rocky islet which is flat on top. Poelau Magnin, about  $1\frac{1}{2}$  mile southward of Poelau Perantoeng, is a low, conspicuous rock which is covered with vegetation. Poelau Langau, nearly  $3\frac{1}{4}$  mile northward of Poelau Gambar, is higher than the other islets and is irregular in shape, and is visible at a distance of 14 miles. The water around these islets is foul. A strong current flows among these islets.

Shoal water, with depths of less than 6 fathoms, extends about 9 miles westward from Poelau Gelam. Coreyra Bank, with a depth of  $1\frac{3}{4}$  fathoms, lies 4 miles westward of Poelau Perantoeng. A shoal with a depth of  $1\frac{3}{4}$  fathoms and a shoal with a depth of  $2\frac{1}{2}$  fathoms lie about  $1\frac{1}{4}$  miles northeastward and  $1\frac{3}{4}$  miles south-southeastward, respectively, of Coreyra Bank.

Poelau Bawal is a large, densely wooded island about 6 miles westward of Tandjoeng Simbar, a point nearly 9 miles northward of Tandjoeng Kepala. The island is mostly low but near its center there are two hills, 290 feet and 221 feet high. The coasts of this island are mostly rocky, and there are numerous rocks offshore. Off the northern extremity there are some small islets; Poelau

Tanahmerah, the highest of these, is reddish in color and rounded in shape. A shoal bank, as defined by the 6-fathom curve, extends up to 5 miles westward and northwestward from Poelau Bawal.

Carysfort Reef, a coral shoal, about  $1\frac{1}{2}$  miles long and with depths from 2 to 8 fathoms, lies about  $14\frac{1}{2}$  miles west-northwestward of the western end of Poelau Bawal.

Tandjoeng Batoe Djoeroeng (Batudjurung), about 8 miles north-northwestward of Tandjoeng Simbar, is a high, rocky point with a narrow ridge of hills, which attains a height of 669 feet in a conical peak about  $3\frac{1}{2}$  miles northeastward of the point and which extends about 7 miles northeastward to the Soengai Kendawangan. Poelau Tjempedak,  $1\frac{1}{4}$  miles westward of the point, is a low and thickly wooded island almost completely surrounded by reefs and rocks. Poelau Tating and Poelau Iras are two rocky islets which lie close off Tandjoeng Djoeroeng.

**7-63 Anchorage.**—There is an anchorage in a gully about  $1\frac{3}{4}$  miles eastward of Poelau Bawal, with depths of about  $6\frac{1}{2}$  fathoms, mostly mud bottom; the anchorage is sheltered in both monsoons. A rock, with a depth of 1 foot over it, lies on the eastern edge of the gully, nearly 2 miles east-northeastward of the southeastern extremity of Poelau Bawal. A drying rock and a rock with a depth of 2 fathoms over it lie eastward of the gully and about  $2\frac{1}{2}$  miles east-northeastward and  $2\frac{3}{4}$  miles east-northeastward, respectively, of the southeastern extremity of Poelau Bawal. A shoal, with a depth of  $2\frac{3}{4}$  fathoms over it, lies about  $2\frac{3}{4}$  miles north eastward of the southeastern extremity of Poelau Bawal. This anchorage can be reached through the channel between Poelau Tjempedak and Poelau Tanahmerah or through the channel between Poelau Tjempedak and Poelau Iras. Both of these channels are very narrow and local knowledge is necessary for their safe navigation.

**7-64 Reede Kendawangan.**—The mouth of the Soengai Kendawangan, about  $6\frac{1}{2}$  miles north-northeastward of Tandjoeng Batoe Djoeroeng, is easily identified from a distance of 4 miles while still in depths of over 3 fathoms. Depths of under  $2\frac{1}{2}$  fathoms extend about  $3\frac{1}{2}$  miles seaward from the river mouth. The depths are very irregular farther inshore, but the local fishermen are familiar with this fair-

way. The greatest depth over the bar at the mouth of the river is 6 feet at low water and about 12 feet at high water. In 1954 three beacons with triangular topmarks marked the channel across the bar.

Poelau Djambat, about  $1\frac{1}{2}$  miles northwestward of the northern entrance point of the Soengai Kendawangan, consists of three low islets and several rocks. There are several above-water and sunken rocks on the northern side of the entrance of the Soengai Kendawangan within a distance of about  $1\frac{1}{2}$  miles westward of the northern entrance point of the river.

Farther inside the entrance of the river the fairway is deep and wide, so that the river upstream from the village of Kendawangan, located just within the entrance, is navigable for small vessels as far as Landjoet, about  $14\frac{1}{2}$  miles northeastward of the mouth.

**7-65 Coast—Off-lying islets and dangers.**—Depths of 2 to  $2\frac{1}{2}$  fathoms extend from 3 to 4 miles off the coast between the northern entrance of the Soengai Kendawangan and Tandjoeng Gangsa. Tandjoeng Gangsa ( $2^{\circ}26'S.$ ,  $110^{\circ}09'E.$ ), about  $6\frac{1}{4}$  miles north-northwestward of the mouth of the Soengai Kendawangan, is a high, rocky point which is fringed by above-water and sunken rocks. The land in the vicinity of the point is hilly and several peaks are visible in the interior. Goenoeng Kedijo (Kedio), 1,689 feet high, is a conspicuous peak about 10 miles northeastward of Tandjoeng Gangsa. Saddle Hill, 807 feet high, Conical Hill, 784 feet high, and Clef Hill, 656 feet high, are three conspicuous peaks on a hilly ridge located between Tandjoeng Gangsa and Goenoeng Kedijo.

The coast is low between Tandjoeng Gangsa and Tandjoeng Pagarantimoen, a hilly peninsula, 271 feet high, with rocky sides, about 12 miles north-northwestward of Tandjoeng Gangsa. Coral reefs and rocks extend as far as  $\frac{1}{2}$  mile northward from the peninsula, and a small islet lies close off the southern side of the point. Tandjoeng Pagarantimoen resembles a small mountain with a gentle slope on its western side.

Poelau Sawi, about  $5\frac{3}{4}$  miles northwestward of Tandjoeng Gangsa, is a low island with high trees, especially on its west side, which are visible from a distance of 12 miles. A shoal area, with depths of less than 6 feet,

extends  $1\frac{1}{2}$  miles eastward from Sawi; remaining depths between the island and the mainland are irregular and less than 20 feet.

Onrust Rif, nearly 6 miles west-northwestward of Poelau Sawi, has a small patch which uncovers; this patch consists of pieces of crushed light brown and white coral and resembles a small sandbank when seen from a distance. About 650 yards northwestward of this patch there are several large rocks with a depth of only about  $1\frac{1}{2}$  feet over them. The bottom is mostly sand around Onrust Rif.

Poelau Mengkoedoe,  $4\frac{1}{2}$  miles westward of Tandjoeng Pagarantimoen, is a steep rock, about 30 feet high, with some vegetation and a few trees on it; this rock is surrounded by a steep-to coral reef with several exposed rocks.

A reef, nearly 2 miles northwestward of Tandjoeng Pagarantimoen, has on it several large rocks, which dry.

The coast between Tandjoeng Pagarantimoen and Tandjoeng Berasbasah, about  $26\frac{1}{2}$  miles north-northwestward, is low and densely wooded. Along this part of the coast vessels should keep outside the 6-fathom curve because the depths inside this curve are irregular and there are sand ridges in the area.

Poelau Tjebe is a low islet lying about 1 mile northward of Tandjoeng Bengkoewang, a point about 4 miles north-northeastward of Tandjoeng Pagarantimoen.

The Soengai Pesagoean is a river which flows out through the coast about  $9\frac{1}{2}$  miles northward of Tandjoeng Bengkoewang. The maximum depth over the bar off the mouth of this river is 3 feet. About 1 mile within the mouth of the river the depths are between 2 and  $2\frac{3}{4}$  fathoms. Praus can reach the Soengai Pawan by tributaries from the Soengai Pesagoean.

**7-66 SOENGAI PAWAN.**—Tandjoeng Berasbasah ( $1^{\circ}50'S.$ ,  $109^{\circ}54'E.$ ) is a low, muddy point which is not easily recognized. Close northward of this point is the mouth of the Soengai Ketapang, and about 3 miles farther north-northeastward is the mouth of the Soengai Kandang Karbau. Soengai Ketapang and the Soengai Kandang Karbau are the two principal delta arms of the Soengai Pawan. The mouth of the Soengai Ketapang dries. Moeara Kajoeng, the capital of the populous and prosperous native state

of Matam, is situated about 60 miles up the Soengai Pawan. Steamers can reach Ketapang, a village located about  $3\frac{1}{2}$  miles up the Soengai Ketapang, only through the Soengai Kandang Karbau.

**7-67 Entrance.**—The channel leading to the Soengai Kandang Karbau has an outer bar, with a depth of not more than  $2\frac{1}{2}$  feet over it at low water, and an inner bar, with a depth of not more than 1 foot over it at low water. This outer channel, which has a bottom of sand and mud, is liable to shift according to the prevailing monsoon. High seas frequently occur over the outer bar during all seasons of the year. A drying reef lies about 1 mile northwestward of Tandjoeng Bawang, the south entrance point of the Soengai Kandang Karbau. A stranded wreck lies on the north side of the drying reef. In 1959 this reef dried from  $\frac{1}{2}$  to 1 mile westward of the river entrance. There are fishing stakes located about  $1\frac{1}{2}$  miles northward of Tandjoeng Bawang. The flats, within the 3-fathom curve, off the mouth of the river, extend about  $2\frac{3}{4}$  miles westward from the north entrance point of Soengai Kandang Karbau, located about  $1\frac{3}{4}$  miles east-northeastward of Tandjoeng Bawang. The drying shore bank, across which the bar had depths of less than 1 foot (1959), extends about  $2\frac{1}{4}$  miles westward from that point. The bar is marked by two beacons, each surmounted by a white ball, the outer of which is located about 2 miles westward of the north entrance point.

The northern side of the channel is marked by beacons, surmounted by black triangles, and the southern side is marked by beacons, surmounted by cylinders. On request to the Harbor Master at Ketapang, lights will be shown from the four beacons on the northern side of the channel and from the inner beacon on the southern side.

A pilot lives at Kandang Karbau, and can be secured upon request.

**Caution.**—The above navigational aids are not charted and may not be in use.

In 1961, it was reported that most of the beacons in the approaches to Soengai Ketapang and Soengai Kandang Karbau were damaged or missing.

**7-68 Roadstead limits.**—The limits of the roadstead of Ketapang are the parallels through Tandjoeng Berasbasah and the mouth of the

Soengai Awan, about 4 miles east-northeastward of Tandjoeng Bawang, and a line drawn  $22^{\circ}$ - $202^{\circ}$  through a position about  $1\frac{1}{2}$  miles westward of Tandjoeng Bawang.

**7-69 Anchorage.**—Small vessels can anchor northward of Poelau Adoeng, an islet close off the north entrance point of the Soengai Kandang Karbau, in 2 to  $2\frac{3}{4}$  fathoms; this anchorage provides shelter against southwesterly squalls.

**7-70 Tidal currents.**—The tidal currents set across the outer channel of the Soengai Kandang Karbau; with a falling tide there is a current with a velocity of 2 to  $2\frac{1}{2}$  knots, with a rising tide there is little or no current.

During the east monsoon, it may be necessary to enter the Soengai Kandang Karbau at night because the diurnal tides strongly predominate and high water occurs between sunset and sunrise. During the west monsoon, when high water occurs during the daytime, the prevailing wind frequently raises the level of the water by at least 1 foot, so that depths greater than those charted are frequently found then.

**7-71 A submarine telephone cable** lies across the Soengai Kandang Karbau, about 2 miles eastward of Tandjoeng Bawang and eastward of the village of Kandang Karbau, which is situated on the southern bank of the river; the shore ends of this cable are marked by signs which are not illuminated at night. About 5 miles east-southeastward of Tandjoeng Bawang, there is a **draw-bridge** across the Soengai Kandang Karbau; the bridge has an opening of 148 feet. Warning signs are placed about  $\frac{1}{4}$  mile up and down stream from this bridge. If the bridge opening is closed at night, two fixed red **lights** are displayed at each warning sign; two fixed green **lights** indicate that the bridge is open. Least depths of 8 to 9 feet are found in the Soengai Ketapang between the village of Ketapang and the point where the Soengai Ketapang and the Soengai Kandang Karbau branch off from the Soengai Pawan.

**7-72** This section has been deleted.

**7-73 KETAPANG** ( $1^{\circ}50'S.$ ,  $109^{\circ}58'E.$ ).—The village of Ketapang is located about 4 miles up the Soengai Ketapang, on the northern bank of this river. A government official and the native Prince of Matam reside in the village.

**Wharf.**—There is a pier at Ketapang, with a depth of 4 feet alongside at low water.

**Communications.**—Ketapang has a radio receiving station controlled by the local government. The village is connected with the regional telephone system.

**7-74 BOCHT VAN SOEKADANA.**—This bay is important only to local traffic from Pontianak through Selat Maja to Soekadana and Ketapang. Bocht Van Soekadana is entered between Tandjoeng Berasbasah and Tandjoeng Keloeang, about 40 miles northwestward of Tandjoeng Berasbasah. Northward of Tandjoeng Berasbasah, the coast on the eastern side of this bay consists principally of a low, densely wooded marsh as far as Tandjoeng Goenoeng, where the coast gradually becomes higher and rockier; Tandjoeng Goenoeng is about 32 miles north-northeastward of Tandjoeng Berasbasah.

The following conspicuous peaks can be seen in the interior: Toenggal, 315 feet high, about 6 miles inland and about  $17\frac{1}{2}$  miles northeastward of Tandjoeng Berasbasah; Goenoeng Seberoewang (Seberoeng) (Pap Hill), 2,438 feet high, with a small nipple shaped top, about  $8\frac{1}{2}$  miles eastward of Tandjoeng Goenoeng; Goenoeng Paloeng, 3,661 feet high, a flat-topped mountain about  $9\frac{1}{2}$  miles northeastward of Tandjoeng Goenoeng; Goenoeng Lobang Tedong, 1,804 feet high, a cone-shaped peak about  $4\frac{1}{2}$  miles northwestward of Tandjoeng Goenoeng; Goenoeng Pekadjang, 1,686 feet high, a cone-shaped peak about  $9\frac{1}{2}$  miles northwestward of Tandjoeng Goenoeng.

**7-75 Islets and dangers.**—Poelau Sempadeh-ketjil, Poelau Sempadeh-besar, and Poelau Tjem-pedak, 295 feet, 310 feet, and 305 feet high, respectively, are thickly wooded islets, with rocky sides, which lie near the coast about 7 miles southward of Tandjoeng Goenoeng. A rock, covered with vegetation, lies close off the southeastern extremity of Poelau Sempadeh-besar.

Numerous above-water and sunken rocks lie within a distance of 2 miles off Tandjoeng Goenoeng; Tokong Pentjalan, about  $1\frac{3}{4}$  miles westward of Tandjoeng Goenoeng, is the outermost of the above-water rocks. Poelau Pajoeng (Perkam) and Poelau Tjermin (Antu) are two rocky islets which lie about  $1\frac{1}{4}$  miles west-northwestward and about  $\frac{3}{4}$  mile west-southwestward, respectively, of Tandjoeng Goenoeng. The coast here

should not be approached inside the 3-fathom curve.

Poelau Djoeanta, 492 feet high, is a thickly wooded islet, with rocky sides, about 8 miles west-southwestward of Tandjoeng Goenoeng; this islet has a conical peak which is a good guide for the fairway to Selat Maja. Poelau Katoeng, 172 feet high, lies about 1 mile southwestward of Poelau Djoeanta and is also rocky and thickly wooded. A reef, which usually breaks, lies about 1/2 mile northwestward of Poelau Katoeng. Some above-water and sunken rocks lie 1/2 mile southward and nearly 1 1/4 miles east-southeastward of Poelau Djoeanta.

Many **fishing stakes** may be encountered in the northwestern part of Bocht Van Soekadana, in an area off the coast between Tandjoeng Keloeng and Tandjoeng Satai. In 1947 the outermost fishing stake was reported to be lying about 10 miles eastward of Tandjoeng Keloeang.

**7-76 Reede Soekadana.**—The Soengai Soekadana flows into a small bay about 6 1/2 miles northwestward of Tandjoeng Goenoeng. Some above-water and sunken rocks, and the small islet Poelau Salah Nama, lie close off Tandjoeng Keroenoet, the southern entrance point of this small bay. Tandjoeng Penaga is a point which lies about 2 miles southeastward of Tandjoeng Keroenoet; Poelau Datok is a thickly wooded islet which lies close off the coast, midway between these two points. Poelau Pelintoewan, 50 feet high, is a small islet lying close off the coast, about 3 1/2 miles northwestward of Tandjoeng Keroenoet.

**7-77 Roadstead limits.**—The limits of the roadstead at Soekadana are the meridian through Poelau Pelintoewan and the parallel through Tandjoeng Penaga.

**7-78 Anchorages.**—Small vessels can anchor in the bay northward of Poelau Salah Nama, in depths of 8 to 10 feet, with a bottom of soft mud; this anchorage provides shelter against steady winds in the southeast monsoon. Vessels unable to anchor in this bay usually anchor about 3 1/2 miles westward of Tandjoeng Keroenoet, in a depth of about 2 1/2 fathoms; this anchorage has a very flat, soft mud bottom. At a lesser depth than 2 1/2 fathoms, ground swells may be encountered; these are very inconvenient because the current from the rivers northward of Soekadana frequently sets a vessel beam on to the wind.

**7-79 Tides.**—The types of tides here are mixed but are predominantly diurnal, subject to some irregularity. Neither the spring high waters nor the spring low waters of the two kinds of tides can coincide. The highest and lowest water levels occurring can be expected to average about 3 feet above or below mean level at each diurnal spring tide, respectively.

**7-80 SOEKADANA** ( $1^{\circ}14'S$ ,  $109^{\circ}57'E$ ), the headquarters of a government official, lies on the northern bank of the Soengai Soekadana. The mouth of this river is almost closed by a stone dam, which is submerged even at half tide. Several unofficial beacons mark the passage in front of and through the opening of this dam. The landing place for the town of Soekadana is inside this dam, on the northern side of the mouth of the river.

**Supplies.**—No supplies for shipping are available.

**Communications.**—This town is connected with the regional telephone system operated by the local government. Small steam vessels, which pass through Selat Maja, connect Soekadana regularly with Pontianak.

**7-81 Soengai Simpang (Sempang)** flows out through the coast about 7 1/2 miles northward of Tandjoeng Keroenoet. The entrance channel over the mud bank fronting the mouth of the river had a depth of about 2 1/2 feet in 1948. The village of Teloekmelano is situated on the northern bank of the river and about 2 miles within the mouth.

There is a **tide gage**, graduated in feet, on the pier, with a depth of 8 feet alongside at low water, at the village of Teloekmelano.

A **submarine telephone cable** crosses the Soengai Simpang at Teloekmelano; the shore ends of the cable are marked by sign boards.

**7-82 Selat Maja.**—Selat Maja is the narrow channel between the main coast of Borneo and Poelau Maja, an island which forms the northwestern side of Bocht Van Soekadana; the southern entrance is about 3 miles wide, but the navigable channel is not quite 1/2 mile wide because of the mud flats which extend from each side of this entrance. Boekit Koembang, 295 feet high, is a conspicuous hill on the eastern side of the southern entrance to Selat Maja; Tandjoeng Toeroen is the western point of this same entrance and is low. A large portion of the eastern side of Poelau Maja is submerged at high water. The bottom in the southern arm of Selat Maja, and even outside this arm, is mostly soft mud. The mud bank which extends from Tandjoeng Toeroen is very steep and

rather hard and its edge is sometimes marked by surf. There is a least depth of about 7 1/2 feet, at low water, in the channel over the extensive bank off the southern entrance of Selat Maja. The depths farther inside the southern arm of Selat Maja vary between 23 and 39 feet.

Small vessels, with local knowledge, make frequent use of the southern arm of Selat Maja when trading between Soekadana and Pontianak.

Less water than charted was reported (1959) to exist in Selat Maja.

**7-83 Poelau Maja** is a large island, about 27 miles long and 17 miles wide, which is separated from the western coast of Borneo by Selat Maja; the southeastern coast of this island forms the northwestern side of Bocht Van Soekadana. The island is mostly low and marshy except in the northwestern part, where the Maja Gebergte and the double-peaked Goenoeng Doesoen, 1,739 feet high, are situated. Tandjoeng Satai is a rocky point, 164 feet high, about 7 miles southwestward of Tandjoeng Toeroen, the eastern extremity of the island. Tandjoeng Keloeang, about 12 1/2 miles west-southwestward of Tandjoeng Satai, is the southernmost point on Poelau Maja; Goenoeng Berantak, 328 feet high, is a small rocky hill nearly 3 miles northward of this point. Tandjoeng Pasir, the southwestern extremity of Poelau Maja, lies about 7 1/2 miles west-northwestward of Tandjoeng Keloeang.

The bottom is mud off the southern coast of Poelau Maja and the depths decrease uniformly toward the shore, except that the bottom becomes harder off Tandjoeng Pasir and the depths decrease sharply at the 2 fathom curve.

Poelau Perling, 138 feet high, and Poelau Aroh, 197 feet high, are two rocky islets lying 1 3/4 miles north-northeastward and 1 1/2 miles east-northeastward, respectively, of Tandjoeng Pasir; from a great distance, these two islets resemble hills on the coast.

Tandjoeng Goenoeng, 387 feet high, is a point lying nearly 6 1/2 miles north-northeastward of

Tandjoeng Pasir; Tandjoeng Tjapbelanda, the northernmost point on Poelau Maja, lies nearly 12 miles farther north-northeastward. Several hills stand near the coast in this area, within a distance of 4 1/4 miles southwestward and 3 miles southward, respectively, of Tandjoeng Tjapbelanda; the highest of these is Goenoeng Sebijau, 695 feet high, about 2 miles southward of Tandjoeng Tjapbelanda.

**7-84 CHANNELS EASTWARD OF KARIMATA EILANDEN.**—Between the Karimata Eilanden and the western coast of Borneo, there are several island groups. Three channels, which lead safely between these islands, will be described hereafter in the following order: (1) The Inner route, which leads eastward of the Vogelnest Eilanden and the Lajah Eilanden, and thence through the channel between Poelau Maja and Poelau Panebangan. (2) Greig channel, as it is called locally, which leads eastward of the Vogelnest Eilanden and Poelau Papan, thence westward of the Lajah Eilanden, and thence through the channel between the Pelapis Eilanden and Poelau Panebangan. (3) The channel between the Pelapis Eilanden and Poelau Boean.

**7-85 Inner route.**—As a rule, this is the route used by small vessels proceeding from Straat Karimata to Pontianak, via Inland Waterway Route II (sec. 7-99). This route can be navigated at night by soundings, even with a slight local knowledge. There is less sea here than in the Straat Karimata area south and west of the Karimata Eilanden and ships can easily anchor here if necessary.

The Vogelnest Eilanden and Poelau Papan, with their adjacent dangers, are described with Greig channel.

The Lajah Eilanden consist of several rocky and thickly wooded islets; Poelau Meledang, 423 feet high, is the largest of these islets and lies with its northern extremity about 12 1/2 miles south-southwestward of Tandjoeng Keloeang, the southernmost point on Poelau Maja. The Inner route passes eastward of Poelau Meledang. Poelau Boelat, 157 feet high, is a small islet which lies



nearly  $3/4$  mile north-northwestward of the northern extremity of Poelau Meledang; two other small islets lie within a distance of about  $1/2$  mile west-southwestward of Poelau Boelat.

Lajah vaarwater is a deep channel which lies between the west coast of Poelau Meledang and Poelau Mensigi, about  $1\frac{1}{2}$  miles westward of the southern extremity of Poelau Meledang. Rob Roy Rock, a very small coral patch with a depth of  $2\frac{1}{2}$  fathoms over it, lies in mid-channel and about 1 mile northeastward of Poelau Mensigi; this coral patch cannot be recognized in any way and its northern and western sides are very steep. Kate of Auckland Rock, with a depth of  $1\frac{1}{4}$  fathoms over it, lies on the western side of this channel and about 1 mile northwestward of Poelau Mensigi; although this rock is not marked by discoloration, it is marked sometimes by breakers and more frequently by tide rips. Several above-water rocks lie within a distance of  $1/2$  mile westward of Poelau Mensigi. This channel usually has a current with a velocity of  $1\frac{1}{4}$  to 2 knots, especially for a few days after high monsoon winds; during the northwest monsoon the current sets south by east and during the southeast monsoon it sets west-northwestward. At the time of the survey, which was made during the transition periods in April and October, a current with a velocity of not more than  $1/2$  knot was observed; this current sets southward during a rising tide and northward during a falling tide and it turns regularly once every day.

**7-86** Poelau Lajah-besar, 335 feet high, and Poelau Lajah-ketjil, 172 feet high, lie about 2 miles and 3 miles west-southwestward, respectively, of the southern extremity of Poelau Meledang. Poelau Lajah-ketjil is the southwesternmost islet of the Lajah Eilanden and can be distinguished from the other islets because it is entirely covered with coconut trees.

Poelau Boeroeng, 174 feet high, which forms a good landmark for the Inner route, is a rocky islet lying about 5 miles west-southwestward of Tandjoeng Pasir, the southwestern extremity of Poelau Maja.

Poelau Panebangan, a densely wooded and mountainous island, lies with its southern extremity about  $9\frac{1}{2}$  miles westward of Tandjoeng Pasir, the southwestern extremity of Poelau Maja. The highest peak on Poelau Panebangan is 1,719 feet high and is near the southern end of the island. Poelau Korok is a small islet lying close off the southeastern coast of Poelau Panebangan. Poelau Aoer, 171 feet high, is a wooded islet which lies about 4 miles east-northeastward of the southern extremity of Poelau Panebangan; a small islet lies about  $1/4$  mile southward of Poelau Aoer. Poelau Djoelai, an islet lying about  $3/4$  mile northwestward of Poelau Aoer, has an above-water rock close off its southwestern side. Poelau Teroesan Hadji is an islet which lies close off the eastern extremity of Poelau Panebangan. Several above-water rocks lie close westward and about  $1/2$  mile northeastward of Poelau Teroesan Hadji. An above-water rock lies about 100 yards off the northernmost point of Poelau Panebangan. The tidal currents along the eastern coast of Poelau Panebangan are usually strong.

**7-87 Caution.**—The depths eastward of Poelau Boeroeng and those about 6 miles west-southwestward of Tandjoeng Pasir, the southwestern extremity of Poelau Maja, are reported to be much shallower than the charted depths; the same applies to the depths between Poelau Aoer and the southeastern coast of Poelau Panebangan. The Inner route should therefore be used with caution by vessels not having local knowledge.

**7-88 Greig Channel.**—Vessels proceeding between Java and Pontianak frequently make use of Greig Channel.

Tokong Perangin (Black Rocks), 56 feet high, is a dark, bare, steep rock which lies about 16 miles south-southwestward of Poelau Lajah-ketjil, the southernmost island of the Lajah Eilanden. When seen from a distance of 8 miles, Tokong Perangin resembles a small conical point and is a good landmark for vessels coming from the south; a reef, with some above-water rocks on it, lies about  $1/2$  mile south-southeastward of Tokong Perangin. This rock and the reef south-southeastward of it

are the southernmost dangers on the western side of Greig Channel.

The Vogelnest Eilanden consist of five steep islets surrounded by coral reefs; Poelau Kerawang (Krawang), 89 feet high, is the easternmost islet of this group and lies nearly 6 miles east-northeastward of Tokong Perangin. Poelau Peloebang, 148 feet high, Poelau Oema, 157 feet high, Poelau Air (Ajer), 125 feet high, and Poelau Soemoer, 82 feet high, lie about 2 1/2 miles northwestward, 2 1/4 miles west-northwestward, 2 1/2 miles westward, and nearly 2 miles westward, respectively, of Poelau Kerawang. A rock, with a depth of 2 1/2 feet over it, lies about 5 miles west-northwestward of Poelau Kerawang. Greig Channel leads eastward of the Vogelnest Eilanden.

Poelau Papan, 230 feet high, is a rocky islet which lies about 8 1/2 miles southward of Poelau Lajah-ketjil. Poelau Matjan, 128 feet high, and Poelau Tawas are two islets surrounded by coral reefs which lie nearly 3/4 mile north-northwestward and about 1/4 mile northeastward, respectively, of Poelau Papan. These islets lie on the western side of Greig Channel.

The Lajah Eilanden have been described with the Inner route in sec. 7-85; Greig Channel leads westward of these islands.

Poelau Goeroeng-besar, 315 feet high, is a thickly wooded, rocky islet which lies about 9 miles northwestward of Poelau Lajah-ketjil. A small islet lies close eastward of Poelau Goeroeng-besar; both of these islets lie on a narrow reef. A coral reef, with a depth of 1 1/4 fathoms over it, lies about 3/4 mile eastward of Poelau Goeroeng-besar; breakers or discolorations are seldom observed over this reef but tide rips are usually seen over it.

Soeka, 289 feet high, is a thickly wooded islet with steep, rocky sides which lies about 7 1/4 miles northwestward of Poelau Goeroeng-besar. Tallack, about 2 miles south-southeastward of Soeka, is a coral reef with a least depth of 1 3/4 fathoms over it; this very steep reef is not marked by breakers or discoloration but in calm weather and a strong current the reef has tide rips over it.

7-89 The Pelapis Eilanden are a group of high, rocky, and densely wooded islands. Poelau Pelapis Tengah (Genting), 1,040 feet high, is the southernmost island of this group and lies with its southern extremity about 1 1/2 miles northeastward of Soeka. Poelau Pelapis Airtiris (Balai), 1,063 feet high, lies close northeastward of the northeastern extremity of Poelau Pelapis Tengah. Poelau Pelapis Kaloeear (Kelawar) lies with its northern extremity about 1/2 mile westward of the northern extremity of Poelau Pelapis Tengah. An islet, 138 feet high, lies about 1/4 mile west-southwestward of the southern extremity of Poelau Pelapis Kaloeear. Poelau Pelapis Airmasin (Aer Masin), 594 feet high, lies close northward of Poelau Pelapis Kaloeear.

There is a safe **anchorage** in a bay with depths of 7 to 10 fathoms, mud bottom, nearly 3/4 mile northward of the northern extremity of Poelau Pelapis Tengah; this anchorage is well sheltered against seas and winds in the southeast monsoon. Note that eastward and southeastward of this anchorage there is a coral reef with some above-water rocks on it which extends about 600 yards from the western side of Poelau Pelapis Airtiris.

During the northwest monsoon good **anchorage** can be obtained about 1/2 mile south-southwestward of the southern extremity of Poelau Pelapis Airtiris in depths of about 6 fathoms, mud bottom.

Poelau Doewa (Doea) (Double Island), 354 feet high, lies with its northernmost point about 2 miles eastward of the northern extremity of Poelau Pelapis Airtiris. There are two conspicuous summits on Poelau Doewa which make it resemble two islets when seen from a distance. A 3 3/4-fathom shoal lies close southeastward of Poelau Doewa.

Poelau Boelat is a small islet which lies 3/4 mile eastward of the northern extremity of Poelau Pelapis Airtiris.

Poelau Sireh, 394 feet high, lies with its southern extremity nearly 1 3/4 miles north-northeastward of Poelau Doewa. A low islet lies close off its northern point and an above-water rock lies close off its western extremity.

There is a safe passage between Poelau Sireh

and Poelau Doewa. There is also a safe passage between Poelau Sireh and Poelau Panebangan.

**7-90 Channel between the Pelapis Eilanden and Poelau Boean.**—Poelau Boean, about 8 3/4 miles south-southwestward of Soeka, has a conspicuous conical peak, 1,017 feet high; this island is surrounded by a narrow reef. Niboeng, 82 feet high, is a rocky islet with a few trees on it which lies 1 3/4 miles southeastward of the northern extremity of Poelau Boean. A drying reef lies 1 3/4 miles east-southeastward of Niboeng; a 5-fathom patch lies close south-southwestward of this reef. A 4-fathom patch lies about 1/2 mile south-southeastward of Niboeng. Oelar, 69 feet high, is a rocky islet with a few trees on it which lies nearly 1 3/4 miles westward of the northern extremity of Poelau Boean.

This wide channel between Poelau Boean and Soeka is seldom used because ships use either the ocean-going steamship route west of the Karimata Eilanden (sec. 7-46), Greig Channel (sec. 7-88), or the Inner Route (sec. 7-46).

**7-91 Islets and dangers eastward and south-eastward of Poelau Karimata.**—A 1 3/4-fathom shoal lies about 8 1/4 miles west-southwestward of Tokong Perangin and about 15 1/2 miles south-southeastward of the eastern extremity of Poelau Karimata.

Poelau Mentangor, 207 feet high, lies about 8 1/2 miles southeastward of the eastern extremity of Poelau Karimata. Genteng, 123 feet high, and Gresik, 123 feet high, lie about 1/2 mile westward and nearly 1 mile eastward, respectively, of Poelau Mentangor. These three islets are thickly wooded and rounded in shape.

Besi, an islet nearly 4 miles northwestward of Poelau Mentangor, has a conspicuous, tower-shaped peak, 154 feet high, which rises above the lower parts of the island. Two drying reefs lie about 3 3/4 miles and about 5 miles west-southwestward, respectively, of Besi.

During the northwest monsoon good anchorage can be found between Besi and Genteng, in a depth of 6 1/2 fathoms, mud bottom; this anchorage can be approached only from the south.

The Tongue Eilanden consist of two steep and rocky-sided islets. Poelau Bakoeng-besar, 236 feet high, is the westernmost of these two islets and lies nearly 12 1/2 miles eastward of the eastern extremity of Poelau Karimata. Poelau Bakoeng-ketjil, 164 feet high, lies about 3/4 mile east-northeastward of Poelau Bakoeng-besar. A 1 1/2-fathom reef and a 4-fathom patch lie about 1 mile southeastward and about 1 mile north-northwestward, respectively, of Poelau Bakoeng-ketjil.

Poelau Pandan, 94 feet high, is a small convex rock covered with vegetation about 2 miles west-northwestward of Poelau Bakoeng-besar. Detached rocks are found as far away as 1,100 yards from Poelau Pandan.

Poelau Lesing (Lising), 387 feet high, is a flat-topped island about 2 miles westward of Poelau Bakoeng-besar. This island is surrounded by a reef and there are three partly overgrown rocks close off the southeastern side of the island. A 2 1/2-fathom patch lies about 1 1/4 miles southeastward of Poelau Lesing.

There are many reefs and dangers eastward of Poelau Karimata and because of these the area enclosed within lines joining the northern extremity of Poelau Karimata, the northern extremity of Poelau Boean, Poelau Bakoeng-ketjil, Poelau Mentangor, and the southern extremity of Poelau Karimata should be avoided.

**7-92 Islets and dangers northward of Poelau Karimata.**—Jamsetjie Rif is a 5-fathom patch nearly 8 1/2 miles north-northwestward of Tandjoeng Senna, the northern extremity of Poelau Karimata. For a distance of nearly 1 mile east-southeastward of this patch there are depths of about 9 fathoms, with a bottom of sand and stones. Northward and southward of Jamesetjie Rif the fairway is clear.

The Leman Eilanden consist of five small, rocky islets surrounded by reefs. Leman Pakoe, 177 feet high, the largest and easternmost of these islets, is about 14 1/2 miles northward of Tandjoeng Senna, the northern extremity of Poelau Karimata. Leman Boedi, 105 feet high, is about 1 3/4 miles west-northwestward of Leman Pakoe; it is the

northwesternmost of these islets and is rounded in shape and covered with vegetation. Tikoes, 72 feet high, lies about 1 mile south-southeastward of Leman Boedi; the reef surrounding Tikoes extends about 650 yards southwestward from it and a large, exposed rock lies about 330 yards north-northeastward of the islet. Gua, 115 feet high, and Leman Toekoeng lie close together on a reef with some above-water rocks on it. Gua lies about 1/2 mile west-northwestward of Leman Pakoe and Leman Toekoeng lies close north-northeastward of Gua. There is a clear channel between Leman Boedi and the other islets and a least depth of 14 fathoms will be found by keeping to the Leman Boedi side of the channel.

**7-93 TELOEK NOERI—WEST COAST OF BORNEO FROM TANDJOENG TEROENG TO TANDJOENG BOEROENG** (*H. O. Charts 3032, 3033*).—**Teloek Noeri** is a bay situated off the northern side of Poelau Maja (sec. 7-82). The western arm of Selat Maja is entered from the head of this bay. Goenoeng Sarat, 745 feet high, and Goenoeng Bongkok, 1,082 feet high, are two peaks which lie close together on the northern side of this bay, about 7 1/2 miles northward and 8 miles northward, respectively, of Tandjoeng Tjapbelanda, the northern extremity of Poelau Maja. Goenoeng Noeri, 633 feet high, lies on the northern side of the bay nearly 6 1/4 miles east-southeastward of Goenoeng Sarat. Roemboer consists of three conspicuous peaks near the head of this bay; the highest of these peaks is 853 feet high and lies nearly 5 1/2 miles eastward of Goenoeng Noeri.

Poelau Hantoe, a densely wooded islet which resembles a small hill when seen from a distance, lies in the middle of the entrance to Teloek Noeri, about 12 3/4 miles west-southwestward of Tandjoeng Tjapbelanda, the northern extremity of Poelau Maja.

Poelau Masatiga, 394 feet high, is a rocky, steep-sided islet which lies on the northern side of the entrance to Teloek Noeri, about 7 miles north-northwestward of Poelau Hantoe. A rocky islet,

387 feet high, lies about 1/4 mile northeastward of Poelau Masatiga.

Poelau Merasak, 197 feet high, a somewhat conical-shaped islet overgrown with vegetation, lies on the northern side of the entrance to Teloek Noeri, nearly 6 1/2 miles eastward of Poelau Masatiga.

Poelau Doea, 95 feet high, consists of two rocks overgrown with vegetation which lie on the northern side of the entrance to Teloek Noeri, 1 1/2 miles east-southeastward of Poelau Merasak.

Tandjoeng Teroeng, the northern entrance point of Teloek Noeri, lies nearly 5 3/4 miles west-northwestward of Tandjoeng Tjapbelanda, the northern extremity of Poelau Maja.

The channel through Teloek Noeri runs for about 10 miles in a northeasterly direction from a point 4 miles eastward of Poelau Hantoe and then curves gradually eastward to the western entrance to the western arm of Selat Maja. There is a bar with a least depth of 2 3/4 fathoms over it, at the western entrance to the channel through Teloek Noeri, about 3 miles southeastward of Poelau Hantoe.

**7-94 Directions.**—Vessels approaching Teloek Noeri from the westward should steer for the highest peak of Goenoeng Doesoen (sec. 7-83) bearing 80°. When Poelau Hantoe is in line with the middle part of Poelau Masatiga, bearing about 336°, a northeasterly course may be steered over the bar at the western entrance to the channel through Teloek Noeri.

Vessels bound for Pontianak can proceed into the western arm of Selat Maja and then follow the Inland Waterway Routes described in secs. 7-85, 7-86, and 7-87.

**7-95 Caution.**—A considerable amount of driftwood, including very thick tree trunks, collects in the area northward and northwestward of the channel through Teloek Noeri.

**7-96 Tandjoeng Teroeng to Tandjoeng Padangtikar** (*H. O. Chart 3033*).—The coast is low between Tandjoeng Teroeng and Tandjoeng Padangtikar, the southern entrance point of Selat Padangtikar, about 19 miles north-northwestward

(7475) **INDONESIA—Borneo—West coast—Sungai Pungur Besar—Beacons changed.**—Tg. Olak Olak Beacon ( $0^{\circ}20'20''$  S.,  $109^{\circ}25'25''$  E. approx.) now shows a *Fl. G. 3 sec.* light.

2. Suka Lanting Beacon ( $0^{\circ}19'15''$  S.,  $109^{\circ}34'53''$  E. approx.) now shows a *Fl. G. 3 sec.* light.

(N.M. 48/66.)

(B.P.I. 34(249, 250, 253, 254), Djakarta, 1966.)

H.O. Chart 3033.

H.O. Pub. 71, 1951, page 149.

(7476) **INDONESIA—Borneo—West coast—Sungai Kubu Ketjil—Beacon changed.**—The green beacon in  $0^{\circ}28'10''$  S.,  $109^{\circ}21'50''$  E. now shows a *Fl. G. 3 sec.* light.

(N.M. 48/66.)

(B.P.I. 33(239, 245), Djakarta, 1966.)

H.O. Chart 3033.

H.O. Pub. 71, 1951, page 149.

(7343) **INDONESIA—Borneo—West coast—Selat Padangtikar—Range discontinued—Buoy established.**—1. The range beacons in the following approximate positions have been discontinued:

(a)  $0^{\circ}35'11''$  S.,  $109^{\circ}19'10''$  E.

(b)  $0^{\circ}35'08''$  S.,  $109^{\circ}19'08''$  E.

(See N.M. 18(2851) 1966.)

2. A buoy, painted black and showing a *Fl.G. 3 sec.* light, exists in  $0^{\circ}35'20''$  S.,  $109^{\circ}19'20''$  E. (approx.).

(B.P.I. 31(222), Djakarta, 1966.)

(N.M. 47/66.)

H.O. Chart 3033.

H.O. Pub. 71, 1951, page 149.

(7478) **INDONESIA—Borneo—West coast—Selat Padangtikar—Buoyage information.**—1. The black and white checkered conical buoy off Tg. Padangtikar is now located in  $0^{\circ}39'15''$  S.,  $109^{\circ}15'40''$  E. (approx.) and shows a *Fl. 3 sec.* light.

~~Note.~~—The above buoy has a black conical topmark.

2. The lighted buoy in  $0^{\circ}39'10''$  S.,  $109^{\circ}05'00''$  E. (approx.) has been moved and relocated 200 meters westward of its charted position.

(N.M. 48/66.)

(B.P.I. 32(231, 232, 237), 37(275), Djakarta, 1966.)

H.O. Chart 3033(1).

H.O. Pub. 112, No. 29205.

H.O. Pub. 71, 1951, page 149.

of Tandjoeng Teroeng. An extensive mudbank, with a few sandy ridges nearly paralleling the shore, fronts this section of the coast. Vessels should keep outside the 5-fathom curve along this section of the coast.

7-97 Western entrance of Selat Padangtikar.—Selat Padangtikar is entered between Tandjoeng Padangtikar and Tandjoeng Boeroeng, a point about 6 1/2 miles northwestward. The entrance of Selat Padangtikar is the deepest of any of the river mouths on the west coast of Borneo; the channel over the bar off this entrance is easily navigable and has a depth of 3 1/4 fathoms at low water.

Inside the entrance, Selat Padangtikar trends in an east-southeasterly direction and connects with Selat Lida by means of Selat Padoeampat. The western entrance of Selat Padangtikar is also the starting point of Inland Waterway Routes III and IV (sec. 7-99) which lead to Pontianak.

A conical light buoy painted in red and white vertical stripes and surmounted by a cross, is moored off the west entrance of Selat Padangtikar, about 10 miles westward of Tandjoeng Padangtikar. A black and white checkered conical buoy, surmounted by a cone point up, is moored about 1/2 mile northward of Tandjoeng Padangtikar on the south side of Selat Padangtikar entrance channel. A black can buoy is moored on the mudbank on the north side of the entrance channel, in a position about 3 miles north-northwestward of Tandjoeng Padangtikar. Two buoys are moored northeastward of the same point in the channel leading to Selat Pandjang.

7-98 Directions.—Vessels approaching the west entrance of Selat Padangtikar should cross the bar on an easterly course from the buoy off the entrance and then pass northward of the buoy moored northward of Tandjoeng Padangtikar. After passing the buoy, vessels bound for Selat Koeboe or Selat Pandjang should steer in the buoyed channel so as to bring Goenoeng Radak in line with Goenoeng Terdjoen, bearing about 062°, which leads between Boeroeng, an islet located about 4 1/2 miles northeastward of Tandjoeng

Pandangtikar and the flats extending westward from Pandjang, an island lying along the north side of Selat Padangtikar. The south entrance of Selat Koeboe is about 6 miles northeastward of Tandjoeng Padangtikar and the western entrance of Selat Pandjang is about 8 miles east-northeastward of Tandjoeng Padangtikar. Goenoeng Terdjoen, 246 feet high, is a summit about 9 1/2 miles northeastward of Tandjoeng Padangtikar. Goenoeng Radak, 669 feet high, is an isolated hill about 12 3/4 miles northeastward of Tandjoeng Padangtikar.

7-99 INLAND WATERWAY ROUTES TO PONTIANAK.—There are four inland waterway routes which lead to Pontianak, a town about 11 miles up the Soengai Kapoeas Ketjil. They are described below. These routes lead through the delta of the Soengai Kapoeas and are for the use of small vessels with local knowledge. With the exception of Inland Waterway Route III, all of these routes are navigable at night when conditions are favorable and with local knowledge.

These inland waterway routes do not permit vessels of deeper draft to reach Pontianak than is the case by the direct seaward route. These routes are therefore used only by small vessels wishing to avoid bad weather conditions or bad sea conditions. Heavy showers, squalls, and thick mists are prevalent in the mornings in the whole of the Soengai Kapoeas delta area; visibility is therefore poor and navigation may be impeded for several hours.

During the west monsoon, considerably greater depths than during other seasons of the year may be expected in the delta of the Soengai Kapoeas. The harbor master at Pontianak can provide the latest information concerning the depths, silting, etc. in the delta of the Soengai Kapoeas.

Inland Waterway Route I.—This route leads from Bocht Van Soekadana through the southern arm of Selat Maja, Selat Lida, Selat Padoeampat, Selat Pandjang, Selat Koeboe, Soengai Poengoer Besar, and thence into the Soengai Kapoeas Ketjil. This route is about 140 miles in length.

INLAND WATERWAY ROUTE II.—This route leads from Telok Noeri through the western arm of Selat Maja, Selat Lida, Selat Mendawak, Soengai Kapoeas, and thence into the Soengai Kapoeas Ketjil. This route is about 170 miles in length.

INLAND WATER ROUTE III.—This route leads from the western entrance of Selat Padangtikar through Selat Pandjang, Selat Djenoe Besar, Selat Djenoe, Selat Mendawak, Soengai Kapoeas, and thence into the Soengai Kapoeas Ketjil. Greater depths may be obtained by passing through Selat Padangtikar instead of Selat Pandjang in order to reach Selat Djenoe Besar. This route is about 144 miles in length.

The coastal bank on the north side of the channel which runs along the southwest side of Pulau Pandjang was reported (1959) to have extended southward, and portions of the bank dried between 9 and 7 miles west-northwestward of Telok Ajer.

INLAND WATER ROUTE IV.—This route leads from the western entrance of Selat Padangtikar through Selat Koeboe, Soengai Poenggoer Besar, and thence into the Soengai Kapoeas Ketjil.



## CHAPTER 8

### WEST COAST OF BORNEO FROM THE SOENGAI PADANGTIKAR TO TANJONG DATU

**8-1 GENERAL REMARKS.**—That portion of the west coast of Borneo described in this chapter extends north-northwestward from the mouth of the Soengai Padangtikar for about 90 miles to Tandjoeng Batoebelat and thence north-northeastward for about the same distance to Tanjong Datu, a salient headland. Except for a few bold headlands and a short stretch at the extreme north end, this coast is low and densely wooded. The south part is occupied by the swampy delta of the Soengai Kapoeas, and a few detached hills some distance inland; the delta mouths form the only landmarks along this part of the coast. The mountains backing the north portion of the west coast of Borneo are considerably more rugged and rise closer to the shore. The entire coast is fronted by the shoal waters of the South China Sea, the 10-fathom curve lying as much as 10 miles offshore and the 20-fathom curve being in general about 75 miles off the southern part of this coast. The territory described in this chapter is a part of Indonesia.

**8-2 TANDJOENG BOEROENG TO THE SOENGAI KAPOEAS KETJIL.**—From Tandjoeng Boeroeng the coast curves north-northwestward, northward, and north-northeastward for almost 40 miles to the mouth of the Soengai Kapoeas Ketjil. This low marshy coast forms the north part of the delta of the Soengai Kapoeas, the largest river on the west coast of Borneo, and is broken into several islands by the various streams discharging through it. Shoal water with a muddy bottom fronts this coast to a distance of 1 to 3 miles as limited by the 3-fathom curve.

**8-3 Landmarks.**—Radak, 669 feet high, is an isolated flat-topped hill located about 16 miles eastward of Tandjoeng Boeroeng, and Terdkoen, a hill surmounted by two conspicuous trees, rises 246 feet in a position almost 13 miles eastward of the same point. The Ambawang Gebergte, the highest peak of which has an elevation of 1,476 feet, is a range of hills about 14 miles northeastward of Tandjoeng Boeroeng and almost 10 miles eastward of the mouth of the Soengai Ambawang.

**8-4 Off-lying shoal** ( $00^{\circ}35' S.$ ,  $108^{\circ}12' E.$ ).—A shoal depth of  $2\frac{3}{4}$  fathoms (sec. 7-58) lies about 60 miles westward of Tandjoeng Boeroeng.

**8-5 Soengai Ambawang** ( $00^{\circ}21' S.$ ,  $109^{\circ}07' E.$ ), one of the mouths of the Soengai Kapoeas, flows into the sea about 14 miles northward of Tandjoeng Boeroeng. The mouth of this river is encumbered by a bar, on which the charted depths range from 1 foot to 3 feet, and its lower reaches are shoal. A white wooden beacon, surmounted by a ball, marks the junction of the Soengai Ambawang with the Soengai Koeboe, about 17 miles upstream.

**8-6 Soengai Poenggoer Besar.**—Between Tandjoeng Poetoas, about 4 miles north-northwestward of the mouth of the Soengai Ambawang, and Tandjoeng Saleh, about 14 miles north-northeastward, the coast consists of several islands, which form the delta of the Soengai Poenggoer Besar, a continuation of the Soengai Kapoeas. Because of the bar that encumbers its mouth and shoal depths in the lower reaches, this river has little navigational importance. A white wooden beacon, surmounted by a ball, marks the edge of a bank, at the junction of this river with the Soengai Koeboe, almost 20 miles upstream.

8-7 SOENGAI KAPOEAS KETJIL.—The mouth of this river forms the northern limit of the delta of the Soengai Kapoeas. The southern entrance point of the Soengai Kapoeas Ketjil is about 6 1/2 miles north of Tandjoeng Saleh but there is no well-defined point marking its northern entrance. The Sultan's house, a conspicuous structure, is situated on the southern entrance point, and the mouth of the river abreast this point is about 2 miles wide. The river is about 38 miles long from its mouth to Soeka Lating, which marks its junction with the Soengai Kapoeas. The town of Pontianak, situated about 10 miles upstream from its mouth, is one of the largest ports on the west coast of Borneo.

DREDGER SIGNALS.—Dredgers operate on the bar of the Soengai Kapoeas Ketjil. Each dredger shows two black balls by day, and a red light above a white light at night, on the side of a vessel should pass; and one black ball by day, and a red light at night, on the side a vessel must not pass.

Vessels should always pass southward of the dredgers, which may require keeping southward of the range lines. Under these long blasts, when the dredger will move to the north side of the channel. The vessel should then maneuver to return to the range line as soon as possible after passing the dredger.

8-8 DEPTHS.—The least depth in the channel over the bar at the mouth of the river was 10 feet (1964), and between the bar and the town of Pontianak the least depth in the fairway was 11 1/2 feet (1957).

8-9 LANDMARKS.—Goenoeng Raja, 2,017 feet high, and Goenoeng Lontjit, 1,541 feet high, are situated about 20 miles northward of the southern entrance point of the river, and Goenoeng Peniraman, 758 feet high, is situated on the coastline about 12 miles north-northwestward of the southern entrance point of the river.

8-10 REEDE PONTIANAK.—Reede Pontianak is the name given to the anchorage off the mouth of the Soengai Kapoeas Ketjil. The limits of the roadstead are between a line drawn in a 220° direction from the summit of Goenoeng Peniraman and a line drawn in a 280° direction from the southern entrance point of the river.

A prohibited anchorage area, with a 7/8 mile radius, is centered about 7 miles south-west by south of Goenoeng Peniraman.

8-11 THE ANCHORAGE in Reede Pontianak is about 6 miles off the mouth of the river in depths of 9 to 11 fathoms, mud bottom. Here the current from the river generally keeps vessels across the wind and sea, but more ground swell is experienced closer in. From November to February vessels should anchor well out, as gales, accompanied by heavy seas that break in shallow water, occur during these months and make entrance to the river dangerous or impossible.

8-12 CHANNEL—NAVIGATION AIDS.—The river entrance is fronted by a bar of soft mud that extends about 5 miles offshore, through which a channel about 50 yards wide has been dredged.

In 1964 the least depth in the channel was 10 feet. The dredged channel is marked from seaward as follows: On the north side by a can buoy and a lighted beacon; on the south side by a spherical buoy with a red St. Andrew's cross topmark (this is the first channel buoy from seaward), a lighted beacon and a checkered black and white conical buoy.

Two lighted ranges lead through the dredged channel as follows: Two lighted beacons in range 113°, standing in the water east-south-eastward of the checkered buoy, lead through the outer portion of the dredged channel. Two lighted beacons in range 107°, standing on the north bank of the river just within the entrance, lead through the inner portion of the channel.

A lighted beacon stands in the water close southward of the inner light of the above range.

8-13 WRECKS.—A dangerous wreck, with mast showing, lies sunk in the approach to the dredged channel, in a position 10 miles northwest-by-westward of the Sultan's house. Another dangerous wreck lies about 5 1/2 miles northwest of the Sultan's house.

A dangerous wreck lies sunk close northward of the can buoy on the north side of the dredged channel.

A partially submerged wreck lies about 1 3/4 miles west-by-northward of the outer range beacon.

8-14 The banks of the river from its mouth nearly to Pontianak are very overgrown, but there are practically no high trees. Some scattered native settlements are located on the north bank, but the south bank is almost uninhabited.

8-15 POELAU PANDJANG, an island about 4 miles long in an easterly and westerly direction and about 1 mile wide near its middle part, is located on the southern side of the entrance to the river, from which it is separated by Selat Bantan, a narrow strait extending in an easterly direction for about 3 1/2 miles from the Sultan's house. Babi, Baharoe, and Poelau Boemin are small islands lying close off the eastern extremity of Poelau Pandjang. A customs house is situated at Djoenkat, on the northern bank about 1 1/2 miles northeastward of the western extremity of Poelau Pandjang. A wreck lies stranded in a position about 750 yards southwestward of the customs house.

8-16 BATOE LAJANG is a reef adjoining an islet on the north side of the river about 8 miles above the mouth. A rock awash, with a depth of 8 feet close eastward, lies about 300 yards southeastward of the islet at Batoe Lajang. A buoy, with a cylinder topmark, is moored about 300 yards south-southwestward of the rock awash. A beacon stands on the north shore about 1 1/3 miles below Batoe Lajang, and a beacon stands on the same shore close northeastward of Batoe Lajang. A beacon stands on the south shore about 1/2 mile southwestward of Batoe Lajang.

8-17 The anchorage at Pontianak is abreast the town, in depths of about 8 1/2 to 10 fathoms, and there is room for vessels to swing in this anchorage. The western limit of the anchorage is the meridian of 109°18'58" E., and its eastern limit is the western limit of the prohibited anchorage described below.

Prohibited anchorage.—Because of submarine telephone cables, anchorage is prohibited in the Soengai Kapoeas Ketjil in the area where this river joins the Soengai Landak. This area is marked by four red triangular boards, each showing a light, at night, which are located directly upstream

and downstream from the junction of the Soengai Kapoeas Ketjil with the Soengai Landak, near Pontianak. Several aircraft mooring buoys are located in this area.

A mooring buoy lies northeastward of the wharf at Pontianak, but it is for the use of government vessels only.

8-18 Winds and weather.—Weather conditions in this vicinity are characterized by heavy showers, strong gusts of wind, and by thick mists during the morning. At times, these mists are so dense that navigation becomes difficult. Gales occur from November to February.

For information regarding rainfall, temperatures, etc. see appendix II.

8-19 Tides.—The tide is mixed and is predominately diurnal. The highest and lowest tides may be expected to occur at tropic springs with a maximum range of about 5 1/2 feet.

8-20 Tidal currents.—Off the mouth of the river, the flood current sets southward and the ebb northward at a velocity of about 2 knots at springs, although the current is considerably influenced by the wind.

The tidal currents are diurnal. The ebb current at Pontianak is of longer duration and stronger than the flood, especially at night because of the land breeze. The maximum velocity of the flood is reached about April and the maximum of the ebb about November. During the west monsoon there is practically no flood at Pontianak, the outflowing river current diminishing only slightly, even at highest tides.

Tidal current signals are shown at Pontianak as follows:

Flood	Red Flag
Ebb	Blue Flag
Slack Water	White Flag

8-21 Floating islands.—Most of the driftwood floats downstream at the highest tides, and large portions of the bank are carried along with it. The masses of wood and soil, which are held together by the underbrush, resemble floating islands and are encountered in the open sea as far south as Karimata Strait.

8-22 Pilots.—There is no official pilotage service, but the Harbor Master can act as pilot if required.

8-23 Directions.—Vessels approaching from the southward should keep the tallest tree on Goenoeng Peniraman and the summit of Geonoeng Lontjit in range 025°, which will lead to a position about 2 miles westward of the outer entrance beacons. Before entering or leaving the harbor, vessels should make certain that passage over the bar is all clear, because there is insufficient room for passing in the dredged channel.

Proceed inward through the dredged channel on the entrance range, maintaining accurate alignment of the range beacons, until arriving on the line of the inner range. At this position alter course left to steer on the inner range, which should be maintained until the vessel has passed the rear light structure of the entrance range. Then keep along the northern side of the channel until abeam of the beacon westward of Batoe Landjang which is marked "Menjeberang" (Cross over). Cross over to the western beacon on the south shore marked "Sisi Daratan" (Hug this shore); thence keep about 200 yards off the southern shore, passing southward of the buoy with topmark at Batoe Landjang until abeam of the beacon marked "Al Klaar" (All clear). A midchannel course should then be steered to Pontianak.

To leave the harbor, proceed in reverse order except that when abeam of the white wooden beacon on the south side of the channel that is surmounted by a ball, leave the line of light beacons on the northern side of the channel and proceed outward between the beacons on either side of the dredged channel with the entrance range astern.

8-24 PONTIANAK (0°01' S., 109°20' E.), the chief town on the west coast of Borneo and the residence of the Sultan of Pontianak,

is situated about 10 miles from the entrance of the Soengai Kapoeas Ketjil and near the junction of this river with the Soengai Landak. The town is situated on low and marshy ground which is partly inundated at high water. The European section of the town lies on the southern bank abreast the junction of the two rivers. The native section and the Chinese section are situated on the northern bank upstream from the junction of the river with the Soengai Landak. A large mosque is also situated here and behind it, connected by a long wooden bridge, is the Sultan's residence. In 1961 the population was 150,220. The principal exports are rubber, spices, and coconut and forest products.

Government Wharf, an open pile timber decked wharf 980 feet long with a depth of 9 feet (1962) alongside, was reported in poor condition (1962). Two warehouses adjacent to this pier have 26,000 sq. ft. of covered storage. There are many warehouses on both banks of the river.

There are two other wharves in the vicinity, one 174 feet long with a depth of 9 feet alongside, and the other 43 feet long with a depth of 8 feet alongside.

A pier about 66 feet long with a depth of 14 feet alongside, is located on the north bank, about 1 1/2 miles above Batoe Lajang.

Harbor craft include a number of towing launches, numerous lighters with capacities of from 70 to 100 tons, and many passenger and car ferries.

Repairs to small vessels can be made here. A government dry dock, 208 feet long and 29 1/2 feet wide over the sill, is situated on the northern bank downstream from the junction of the Soengai Kapoeas Ketjil with the Soengai Landak.

Supplies.—Fresh provisions are available in limited quantities. Water is scarce, and should be boiled before drinking.

Communications.—Pontianak is connected with Java and Billiton, via Tanjong Pandan,

by submarine cable. There is a radio station and also a local telephone system. Pontianak is a regular port of call for inter-island vessels. British vessels call here occasionally, enroute to or from Singapore. Chinese junks also call here, but their principal trade is with Singapore. Scheduled air service is maintained.

Medical.—There are four hospitals in Pontianak, one of which contains about 90 beds.

8-25 Upper River.—From Pontianak the Soengai Kapoeas Ketjil trends southeastward for about 28 miles to Soeka Lating where it joins the main river, the upper part of which is called the Soengai Kapoeas and the

lower part the Soengai Poengoer Besar. A beacon, surmounted by a white ball, marks the junction of these rivers at Soeka Lating. Between Pontianak and the village of Teloekkoempai, situated about 10 miles upstream from Pontianak, the river banks are low and marshy; above this point the banks have largely been cleared and consist of paddy fields, small trees and brushwood. This portion of the river is navigable by vessels drawing not over 10 feet and there are no dangers, but the sharp turns near the village of Teloekkoempai and at Tandjoeng Selebes, about 1 mile northward of Soeka Lating, should be guarded against.

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**8-26 SOENGAI KAPOEAS.**—The Soengai Kapoeas is the principal river of western Borneo, and from its junction with the Soengai Kapoeas Ketjil it trends generally eastward for a distance of about 620 miles.

The navigability of the Soengai Kapoeas differs greatly in the dry and wet years. At mean water level, the river is navigable for vessels drawing up to 12 feet and having local knowledge to the town of Tayan, about 100 miles from the mouth of the river. Vessels drawing up to 10 feet may proceed for a distance of about 150 miles farther to the town of Sintang, which is a military station and the residence of a government official. Vessels drawing up to 7 feet can reach Selimbau, about 92 miles upstream from Sintang and motor boats drawing up to 4 feet can proceed as far as Putus Sibau, about 114 miles farther. Beyond this point, the river is navigable by praus (native rowing craft) for an additional 100 miles.

When the river is low, which condition occurs about every 3 years, its lower reaches are navigable only by vessels with a draft of not more than 6 feet and at these times the depths in the river between Selimbau and Putus Sibau are as little as 1 foot.

**8-27 Dangers** in the river consist mostly of hidden rocks in the vicinity of Sanggau, about 150 miles inland. During the wet season, these rocks are particularly hazardous as they are submerged and difficult to distinguish. Floating logs may also be encountered. The river is characteristically silted up at almost every bend and care must be taken to keep along the inner bank when rounding these bends.

**8-28 TRIBUTARIES OF THE SOENGAI KAPOEAS.**—The Soengai Tayan, which flows into the Soengai Kapoeas at the village of Tayan, can be navigated at mean water level by large praus for a distance of about 63 miles to the Chinese settlement of Bunan. At low water the river is not navigable. After heavy rains serious bajirs (floods) of brief duration occur.

**8-29 The Soengai Sekayan** joins the Soengai

Kapoeas at the village of Belitang, about 65 miles upstream from Tayan, and is navigable at mean water by vessels drawing up to 7 feet as far as its junction with the Soengai Ansar, about 20 miles upstream from Belitang. At high water vessels drawing up to 6 feet can proceed up the river as far as the village of Balai Sepuwah, about 40 miles upstream from Belitang.

**8-30 The Soengai Melawi** is the most important tributary in the middle course of the Soengai Kapoeas, which it joins just downstream from Sintang. At mean water level this river is navigable by vessels drawing up to 7 feet for a distance of about 50 miles to the town of Nangah Pinoh, which is the residence of a government official and contains a Chinese-Malayan settlement. At this point the river is 200 yards wide. Upstream from Nangah Pinoh the river gradually decreases to a width of 100 yards and at high water level vessels drawing up to 4 1/2 feet can sometimes proceed as far as the Malayan settlement of Nangah Serawai, 83 miles upstream from Nangah Pinoh. Because of whirlpools, however, such vessels must have a competent pilot and a speed of at least 9 knots. Large praus can proceed an additional 13 miles as far as Pagar Lebata.

After heavy rains, which may be expected to occur during the months of November, December, January, and March, floods sometimes interrupt navigation for about 48 hours.

The river cannot be navigated, even by small motor boats, after a period of dry weather such as occurs during the months of February, June, July, and August. After a prolonged dry spell the mouth of the Soengai Melawi is almost dry and its waters flow into the Soengai Kapoeas in a manner resembling that of a waterfall.

**8-31 The Soengai Ketoengau** flows into the Soengai Kapoeas about 30 miles upstream from Sintang. At mean water level it is about 100 to 165 feet wide and is navigable by vessels drawing not more than 4 feet for a distance of about 56 miles.

**8-32 The Soengai Silat** discharges into the Soengai Kapoeas at a position about 110 miles

upstream from Sintang. This river is the principal outlet for the large lakes located northward of the village of Selimbau. At high water level it is possible for vessels drawing up to 10 feet to reach and navigate these lakes, provided that their length is not too great. A native pilot is recommended, especially at very high water when the lake district resembles an enormous marsh. During extended dry periods, the lakes dry up.

**8-33 The Soengai Brunut** empties into the Soengai Kapoeas about 60 miles upstream from Selimbau. At high water level vessels drawing not more than 4 feet can proceed up this river to the mouth of the Soengai Boyan, 40 miles upstream from the town of Brunut, which is situated at the junction of the Soengai Brunut with the Soengai Kapoeas.

**8-34 The Soengai Embeluh** flows into the Soengai Kapoeas at Nangah Embeluh, about 12 miles upstream from Brunut. At high water level this river can be navigated by vessels drawing up to 4 feet as far as Ulak Pauh, a Dyak village about 75 miles upstream from Nangah Embeluh.

**8-35 The Soengai Palin** joins the Soengai Kapoeas at a position about 2 miles upstream from Nangah Embeluh and can be navigated by small vessels for a distance of about 15 miles.

**8-36 The Soengai Mandai** flows into the Soengai Kapoeas at a position about 23 miles upstream from Nangah Embeluh. At mean water level vessels drawing not more than 4 feet can proceed as far as Nangah Kalis, 40 miles upstream.

**8-37 SOENGAI KAPOEAS KETJIL TO TANDJOENG BATOEBELAT BAROENG EILANDEN.**—From the mouth of the Soengai Kapoeas Ketjil the coast trends about 48 miles in a general northerly direction to Tandjoeng Batoebelat. For the most part it is low and marshy and there are very few hills near the coast except at Tandjoeng Batoebelat and at Tandjoeng Terajun, about 7 miles southward. Along this portion of the coast the 5-fathom curve extends from 7 miles offshore northward of the Soengai Kapoeas Ketjil to as little as

1/2 mile offshore near Tandjoeng Batoebelat. Several small rivers empty into the sea along this coast, the most important of which is the Soengai Mampawah.

**8-38 Landmarks.**—Goenoeng Raja, Goenoeng Lontjit and Goenoeng Peniraman have been described previously. (See sec. 8-9.) Goenoeng Timahobe, 1,589 feet high, lies about 11 1/2 miles northward of Goenoeng Lontjit and is a conspicuous landmark. Goenoeng Batoe Baja, 1,147 feet high, lies about 10 miles northwestward of Goenoeng Timahobe. Raja Gebergte, a prominent range of mountains lying about 11 miles northward of Goenoeng Batoe Baja, has several conspicuous peaks of which Goenoeng Raja, 3,022 feet, and Goenoeng Pasi, 2,525 feet, are the highest. The Baroeng Eilanden, a group of islands that fronts this section of the coast, also provides useful landmarks.

**8-39 The coast** curves northwestward from the mouth of the Soengai Kapoeas Ketjil for a distance of about 24 miles to Tandjoeng Bangkai, a low, flat point projecting about 3 miles from the coast, and from which a mud bank, with depths of less than 5 fathoms, extends as much as 6 miles seaward.

**8-40 The Soengai Mampawah** is a small river that flows into the sea on the eastern side of the projection terminating in Tandjoeng Bangkai. At high water vessels drawing not more than 5 feet can navigate this river for a distance of about 20 miles upstream to the Chinese village of Mendialin. The Malayan town of Mampawah is situated on the eastern bank of the river about 4 miles from its mouth.

**8-41 Anchorage** is available anywhere between the Soengai Kapoeas Ketjil and the Soengai Mampawah in depths of 5 to 8 fathoms, mud bottom, and there are no dangers off this part of the coast.

**8-42 Poelau Datoek** ( $0^{\circ}08'N.$ ,  $108^{\circ}36'E.$ ), an island about  $1\frac{1}{2}$  miles long in a northerly and southerly direction, is situated about 22 miles southwestward of Tandjoeng Bangkai. It is densely wooded and has two



peaks, the higher of which is 1,004 feet. The island is steep-to, except in a few places where a coastal reef extends a short distance offshore. The island is uninhabited.

A shoal, with a depth of 4 fathoms, mud and sand bottom, lies about 8 1/2 miles southward of Poelau Datoek.

8-43 The coast from Tandjoeng Bangkai trends northward for a distance of about 29 miles to Tandjoeng Batoebelat. It is generally low and wooded and has trees extending down to the water's edge. A coastal bank, with depths of less than 3 fathoms, extends as far as 2 1/2 miles from this part of the coast.

8-44 TANDJOENG SANGGAU is situated about 9 1/2 miles northward of Tandjoeng Bangkai. Between these points the coast recedes, forming a bight. Peniboengan, a hill 178 feet high and formerly an islet, stands on the coast about 3 3/4 miles north-northeastward of Tandjoeng Bangkai. Goenoeng Kebangsi, 492 feet high, is situated about 2 1/2 miles eastward of Tandjoeng Sanggau and Goenoeng Bangkam, 507 feet high, lies about 3 1/2 miles east-northeastward of the point.

8-45 TANDJOENG TERANJUN, situated about 13 miles northward of Tandjoeng Sanggau, is high and cliffy. Goenoeng Boenga, 640 feet high, lies close northward of this point. Poelau Semesa, 364 feet high, and Poelau Tempoeroeng, 98 feet high, are small islands lying respectively about 1/2 mile westward and northwestward of the point. Both are densely wooded. Poelau Keran, a high rock, lies about 200 yards southeastward of the point.

8-46 THE SOENGAI RAJA, with a depth of only 1 1/2 feet at its mouth, empties into the sea close southeastward of Poelau Keran.

8-47 TANDJOENG BATOEBELAT (Batu Belat), the westernmost extremity of Borneo, is a prominent point that can be identified by its five peaks, close together. The highest of these, Goenoeng Batoebelat, lies about 1 mile eastward of the point and is 689 feet high. Batoe Pajoeng, an above-water rock, lies close off the southern side of the point within the 3-fathom curve, which is about 1 mile offshore at this part of the coast.

8-48 BOEROENG EILANDEN (KEPULAUAN BURUNG).—This group of islands,

most of which are steep-to and densely wooded, lies about 10 miles off the west coast of Borneo between Tandjoeng Bangkai and Tandjoeng Batoebelat. With the exception of several shoals, which will be described in connection with the localities where they are situated, the channel between these islands and the coast and between the islands themselves are deep and free of dangers.

8-49 POELAU SI TINDJAN (0°22' N., 108°45' E.), 157 feet high, is the southernmost island of the group and is situated about 10 1/2 miles westward of Tandjoeng Bangkai. It is nearly 1 mile long in a northerly and southerly direction and about 1/4 mile wide. The island has been reported (1958) to be a good radar target at a distance of 25 miles. A bank, with depths of less than 10 fathoms, extends about 1 mile southward and about 1/2 mile northward from the island. During northerly winds and at the change of the monsoons vessels can anchor on the southern part of this bank in depths of 7 to 9 fathoms, sand bottom.

8-50 POELAU DAMAR is a circular, comparatively steep-to islet, 79 feet high, lying about 3 miles northeastward of Poelau Si Tindjan.

8-51 POELAU TEMADJOE, 787 feet high, and one of the larger islands of the group, lies about 2 3/4 miles westward of Tandjoeng Sanggau. It is about 2 1/2 miles long in a northerly and southerly direction and about 1 1/2 miles wide. A partly drying reef extends off the northern part of the eastern coast for a distance of about 1/4 mile. A channel, about 1 mile wide between the 5-fathom curves, lies between the island and Tandjoeng Sanggau. There are depths of 5 1/2 to 10 fathoms in the fairway of the channel.

Anchorage is available in depths of 6 to 7 fathoms anywhere around the island, except off the westernmost point, where the depths are too great. During the south monsoon vessels may also anchor in Djaksa Baai, the larger of the two bays on the northern side of the island, in a depth of 5 fathoms.

8-52 POELAU BAROE, a small island 226 feet high, is situated about 8 miles northwestward of Poelau Temadjoie. It is fringed by a reef that ex- (continued on page 158)

tends about 1/4 mile southward and northwestward from the island. A small detached **shoal**, steep-to and with a least depth of 4 fathoms, lies about 1/2 mile northwestward of the island.

**8-53 Poelau Lemoekoetan** is the largest and westernmost island of the group. It is about 4 1/2 miles long in a northerly and southerly direction and about 1 mile wide. Its southern point lies about 7 1/2 miles northward of Poelau Baroe. The island consists of a ridge of mountains, the highest of which is 1,200 feet and is situated near its southern end. The shores of the island are mostly rocky, except near the center of the eastern side where two small bays indent the coast for a distance of about 1/4 mile. Two rocks, with depths of less than 6 feet, and about 2/3 mile apart, lie close off the northern side of the island.

**8-54 Poelau Randajan** is a small island, 69 feet high, and situated 1 mile from the southern end of Poelau Lemoekoetan. A bank, with depths of 6 to 8 fathoms, extends about 3/4 mile northward and southward from the island, but it is fairly steep-to off its eastern and western sides. The channel between this island and Poelau Lemoekoetan is free of dangers.

**8-55 Poelau Penata Besar** is an island, 335 feet high, about 2 1/4 miles long in a northerly and southerly direction and about 2/3 mile wide. It is situated about 2 miles eastward of the southern part of Poelau Lemoekoetan and the channel between these two islands is deep and clear. Batoerakit, a group of above-water rocks, lies about 500 yards off the northern shore of the island, and a shoal, with a least depth of 1 1/2 fathoms, extends about 500 yards from its western side.

**8-56 Poelau Penata Ketjil** is an island situated about 1 mile eastward of Poelau Penata Besar and the channel between the two islands is deep and free of dangers. The island is 344 feet high and about 2/3 mile wide at its widest part. Detached **shoals**, with depths of 3 1/2 to 4 1/2 fathoms, extend northward from this island for a distance of about 1 3/4 miles. Another **shoal**,

with a least depth of 23 feet, lies about 3 3/4 miles south-southeastward of the island and about 4 miles westward of Tandjoeng Teranjun. The center of Poelau Kaboeng in range 348° with Poelau Seloewas, both of which islands are described below, leads close eastward of this shoal.

**8-57 Poelau Seloewas**, an islet 79 feet high, is situated about 1/2 mile northeastward of Poelau Penata Ketjil. The channel between these two islands is foul and shallow. A shoal, with a least depth of 2 1/2 fathoms, lies close westward of the island.

**8-58 Poelau Kaboeng** (0°50' N., 108°47' E.) is the northernmost island of the Boeroeng Eilanden and is situated about 4 miles northward of Poelau Penata Ketjil. It is 974 feet high, and about 1 1/4 miles wide at its widest part. A spit, with a least depth of 19 1/2 feet, extends about 1 mile from the southern end of the island, and a shoal, with the same least depth, extends about 1 mile from its northern end. Two shoals encumber the fairway between this island and the mainland; one, with a least depth of 4 1/2 fathoms, lies about 1 1/2 miles southeastward of the island, and the other, with a least depth of 2 1/4 fathoms, lies about the same distance eastward.

**8-59 Tides.**—In the vicinity of the Boeroeng Eilanden the tides are of the same general character as those in the vicinity of Reede Pontianak, except that their range is somewhat less. (See sec. 8-20.)

**8-60 Tidal Currents.**—The tidal currents in this area overcome the monsoon currents. The flood sets southeastward and the ebb northwestward with a velocity of about 2 knots. Vessels proceeding along the western coast of Borneo will often experience a calm sea and may sometimes take advantage of a favorable tidal current by keeping reasonably close inshore.

**8-61 TANDJOENG BATOEELAT TO TANJONG DATU—API PASSAGE.**—The coast from Tandjoeng Batoebelat trends gen-

erally north-northeastward for about 75 miles to Tandjoeng Moenggoeresak and thence east-northeastward for about 20 miles to Tanjong Datu. This point marks the boundary between Borneo and the territory of Sarawak, the latter being a British protectorate. The coast is generally low and wooded, and there are no hills of any size along the coast except at Tandjoeng Badjau, which is about 4 1/2 miles northeastward of Tandjoeng Batoebelat, and near Tandjoeng Bila, which is about 18 miles northward of Tandjoeng Badjau. Along this part of the coast the 5-fathom curve lies as much as 5 miles offshore between Tandjoeng Badjau and Tandjoeng Bila to less than 1/2 mile offshore near Tanjong Datu. Several rivers flow into the sea along this part of the coast, the most important of which are the Soengai Sambas Besar and the Soengai Paloh.

**8-62 Landmarks.**—The highest mountains in western Borneo back this part of the coast. Goenoeng Padang, 3,200 feet high, and Goenoeng Bawang, 4,731 feet high, are situated respectively about 34 miles eastward and east-northeastward of Tandjoeng Batoehelat. Goenoeng Tadjoe Djaning, 5,085 feet high, is situated about 21 miles southward of Tanjong Datu.

**8-63 Coast.**—From Tandjoeng Batoebelat the coast trends in a northeasterly direction about 4 1/2 miles to Tandjoeng Badjau, a hilly point of land projecting nearly 1 mile from the coast. Between these two points the coastline is interrupted by two small projections known as Tandjoeng Gondol and Tandjoeng Merah lying respectively about 3/4 mile and 2 1/4 miles northeastward of Tandjoeng Batoebelat. Batoe Bendang, a group of above-water rocks, lies about 1/4 mile north-westward of Tandjoeng Merah.

**8-64 Reede Van Singkawang.**—Between Tandjoeng Badjau and Tandjoeng Bila, about 18 miles northward, the coast recedes about 4 miles, forming a bay known as Reede Van Singkawang. The shoreline is low and flat except at Tandjoeng Goenoeng, which is 512 feet high and situated about 4 1/2 miles southward of Tandjoeng Bila.

**8-65 Landmarks.**—Goenoeng Sjakok, 994 feet high, and Goenoeng Sekoenang, 325 feet high, are conspicuous hills, lying respectively 2/3 mile and 1 1/3 miles inland. The former is situated about 4 1/2 miles eastward of Tandjoeng Bajau and the latter about 11 miles north-northeastward. The northern coast of Reede Van Singkawang is backed by Goenoeng Simpadang, 905 feet high and Goenoeng Serindoeng, 856 feet high, but neither is particularly valuable as a landmark.

**8-66 Good anchorage** is available in Reede Van Singkawang in depths of 6 fathoms, mud bottom.

**8-67 Soengai Singkawang** flows into Reede Van Singkawang at a position about 5 miles northeastward of Tandjoeng Badjau. A flagstaff stands on the southern bank and near the mouth of the river. In daytime a cylinder, with horizontal white and black bands, is shown from this flagstaff. The entrance of this river is encumbered by a bar that almost dries, and passage over the bar is very difficult, even for small vessels.

The Soengai Selakau and the Soengai Sebangkau flow into Reede Van Singkawang between the Soengai Singkawang and Tandjoeng Bila, but neither is of any importance to shipping.

**8-68 Singkawang** ( $0^{\circ}55' N.$ ,  $108^{\circ}59' E.$ ), a town of some importance, is situated about 2 miles upstream from the mouth of the river of the same name. It is the residence of a government official and also that of an officer of the Chinese government. The population consists mostly of Chinese although a few Europeans reside here. In 1945 the population was between 10,000 and 15,000. The town's main products are rubber and coconut oil. It has a local and long distance telephone system and is connected by road with Pontianak and with Sambas, about 33 miles to the northeastward. A radio station is also located here. Medical assistance is available.

**8-69 Tandjoeng Bila**, the southern entrance point of the Soengai Sambas Besar, is a low flat point that is difficult to identify. Goenoeng Pamangkat, a conspicuous mountain 1,296 feet high is situated about 3 1/4 miles eastward of Tandjoeng Bila. From a great distance seaward this

mountain is often mistaken for Tandjoeng Bila, which actually is still below the horizon.

**8-70 The Soengai Sambas Besar** is entered between Tandjoeng Bila and Tandjoeng Kalangbae, about 3 miles northeastward. Poelau Pekak, a conspicuous rocky islet, 104 feet high, lies about  $\frac{1}{2}$  mile northwestward of Tandjoeng Kalangbae, and Poelau Belachan, an islet 47 feet high, lies close southeastward of the same point. A rock, which dries 3 feet, lies close southward of Poelan Belachan. Flats, with depths of less than 1 fathom, extend about  $\frac{3}{4}$  mile northwestward from Tandjoeng Bila and as much as  $3\frac{1}{2}$  miles westward and from Tandjoeng Kalangbae.

**8-71 Depths.**—The entrance of the river is fronted by a bar, the outer edge of which is steep-to and lies about 2 miles northwestward of Tandjoeng Bila. At mean lowest water level, the least depth on the bar was reported (1957) to be 7 feet. At high water and under favorable conditions, it is stated that vessels drawing as much as 12 feet can enter the river. From the mouth of the river to its junction with the Soengai Sambas Ketjil, a distance of about 15 miles, there is a least depth of 10 feet (1959), and its width varies from  $\frac{1}{2}$  to 1 mile. From this point as far as the village of Kartijasa, about 10 miles farther upstream, the least depth is about 19 feet.

A light is shown upon request from a white mast with black bands, located on Tandjoeng Peniboengan. Another light is shown from the seaward end of some fishing stakes about 3 miles west-northwestward of the same point.

**8-72 Obstructions.**—The mouth of the river northward and northwestward of Tandjoeng Bila is generally encumbered by fishing stakes. Obstructions lie in the entrance of the river in a position nearly 2 miles west-southwestward of Tandjoeng Kalangbae.

A red can buoy with a red cylindrical topmark is located close westward of the dangerous area.

There are numerous villages and settlements on both banks of the river as far as Kartijasa, about 26 miles upstream from its mouth. The Soengai Bantan flows into the Soengai Sambas Besar about 2 miles downstream from Kartijasa and abreast this junction lies Poelau Boengin, an island about  $\frac{2}{3}$  mile long.

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**Tidal currents.**—In Soengai Sambas Besar the tidal currents are semi-diurnal and attain a rate of about 2 knots in the entrance at springs. Off the entrance the tidal currents run in a north-south direction at a rate of about  $1\frac{1}{2}$  knots. During the ebb-current from the river the coastal current sets to the northward.

**8-73 Directions.**—Vessels entering the river should proceed to a position about  $4\frac{3}{4}$  miles west of Tandjoeng Kalangbae and then steer for that point bearing  $086^\circ$ , passing south of the fish trap marked by a pole from which a light is shown. When south of the above pole alter course to  $090^\circ$  to pass close south of the red can buoy, thence alter course to  $097^\circ$  for the anchorage in the mouth of the river; this course will lead between one of the obstructions (section 8-72) and the northern spur of a fish trap. On this track there is a least depth of 8 feet (1950).

**8-74 Prohibited anchorage.**—A submarine cable crosses the river at a position near the western end of Poelau Boengin. Anchorage is prohibited within a distance of about 50 yards northeastward and southwestward of a line joining the two beacons marking the submarine cable and situated on either side of the river. The limits of this prohibited anchorage are marked by red triangular boards, with privately maintained lights, situated on each bank of the river.

**8-75 Anchorage** is available abreast the village of Pamangkat, situated on the southern side of the river entrance near Tandjoeng Peniboengan, which is a spur of Goenoeng Pamangkat, 272 feet high, and situated opposite Tandjoeng Kalangbae. The limits of the anchorage are defined by a line joining Tandjoeng Bila and Tandjoeng Kalangbae and a line drawn in a  $146^\circ$  direction from Goenoeng Raja, situated about  $4\frac{1}{2}$  miles north-northeastward of Tandjoeng Kalangbae. The mud bank that fronts the southern bank of the river between Tandjoeng Peniboengan and Tandjoeng Parakan, about  $1\frac{1}{2}$  miles northeastward, is very steep-to and caution must be exercised by vessels anchoring in this area. The dangerous wreck of a sailing vessel lies sunk about  $\frac{1}{4}$  mile northeastward of Tandjoeng Peniboengan. Breakers mark the wreck.

The narrow channel leading to Pamangkat is marked by unofficial beacons, and has a least depth of about 2 feet.

**8-76 The Soengai Sambas Ketjil** flows into the Soengai Sambas Besar about 15 miles upstream from Tandjoeng Kalangbae. From its mouth to the town of Sambas, about 13 miles upstream, there are depths in the fairway of not less than 20 feet except in the vicinity of the inner bar.

**8-77 Inner bar.**—The portion of the Soengai Sambas Ketjil about 6 miles upstream from its mouth, where it is joined by the Soengai Se Batoe, is known as the inner bar.

**8-78 A channel**, 82 feet wide, and with a least depth of 9 feet (1959) leads over this rocky bar.

Two range beacons, surmounted by white triangles, the front triangle point up and the rear triangle point down, in line 015°, are located on the western bank of the river, and these beacons in range lead through the channel. A dangerous wreck lies on the rocks on the western side of the channel. The wreck dries about 3 feet; it is marked by a beacon, surmounted by a cross, which also covers at high water. It is not advisable to pass the wreck at highest high water due to it and the beacon being covered at such time. In 1959 there was a 5-foot shoal about 50 yards south-eastward of the wreck. A stony patch, with a depth of 9 feet, lies about 200 yards southwestward of the wreck. Two notice boards with navigational instructions lie about 500 yards southwestward and 100 yards southward of the wreck. A board with the inscription "Group of Stones", stands on the east side of the bank of the river about 100 yards eastward of the wreck. The board southwestward of the wreck is inscribed "Keep this side" for vessels bound upstream, and "All clear" for vessels bound downstream. The board southward of the wreck is inscribed "Go across" for vessels bound upstream, and "All clear" for vessels bound downstream. Local knowledge is necessary for the safe navigation of this channel. Because the flood current sets strongly into the mouth of the Soengai Se Batoe, vessels should arrange to reach the inner bar at high water slack. Two tide gages, marked in decimeters, are located in the vicinity of the wreck. One of the gages stands near the left bank of the river about 500 yards below the wreck and the other stands near the right bank about 300 yards above the wreck.

**8-79 Tides.**—Tide constants have been determined at Pamangkat. The tides are mixed, but predominately semi-diurnal with a mean range of about 1.8 feet and a spring range of about 2.1 feet. As a rule, the periods of the tides upstream are about 1 hour later for each 10 miles so that there is high water (or low water) at the inner bar about two hours later than at the outer bar at the mouth of the Soengai Sambas Besar.

**8-80 Tidal currents.**—The tidal current is semi-diurnal and is strongly felt as far upstream as Sambas. The tidal current toward the time of low water is very strong near the wreck mentioned in section 8-78.

**8-81 Sambas** ( $1^{\circ}22'B., 109^{\circ}18'E.$ ) is a town about 13 miles upstream from the mouth of the Soengai Sambas Ketjil and about 27 miles upstream from the mouth of the Soengai Sambas Besar. It is the residence of a government official. The inhabitants are largely Malays, Chinese, and Celebesians, but there is a small Dutch settlement. The population in 1942 was about 15,000. The principal products are rice, lumber, coffee, and kapok.

**Jetty.**—There is a jetty, with a length of 213 feet, and a depth alongside for vessels with drafts up to 13 feet. Vessels up to 200 feet long can be turned easily in this part of the river, which is 260 feet wide at this point.

**Communications.**—Sambas is a regular port of call for mail steamers and there is regular communication by sea with Singapore and other Indonesian ports. A small boat canal connects Sambas with Kartijasa, about 2 miles to the northwest. The town is connected with the general telegraph and telephone system.

Medical assistance is available.

**8-82 COAST.**—From the mouth of the Soengai Sambas Besar the coast trends in a north-northeasterly direction for about 5 miles to a point formed by the spur of Goenoeng Raja, a mountain 409 feet high. Poelau Pontianak, a conspicuous islet 180 feet high, lies about 1/2 mile southwestward of Goenoeng Raja. The coast then trends northeastward and northward for a distance of about 14 miles to Tandjoeng Bajoeng and thence northeastward about 20 miles to the mouth of the Soengai Paloh. With the exception of Goenoeng Raja, this entire portion of the coast is low and flat. Goenoeng Sendjoedjoeh, 1,368 feet high, is situated inland about 24 miles eastward of Tandjoeng Bajoeng. It has a conical top, which shows slightly above the surrounding mountains, but it is not as isolated as the chart indicates.

A nondangerous wreck, the position of which is approximate, lies sunk about 10 1/2 miles west-northwestward of Goenoeng Raja.

**8-83 Depths offshore.**—Between the mouth of the Soengai Sambas Besar and Tandjoeng Bajoeng the 10-fathom curve is generally parallel to the shore and about 5 miles distant therefrom, except at Tandjoeng Bajoeng where it is only about 3 1/2 miles offshore. Southward of Goenoeng Raja, the 10-fathom curve is only 1/2 mile outside the 3-fathom curve and vessels should not approach within the former. Northward of Goenoeng Raja the depths decrease gradually toward the shore and anchorage may be had in the bight formed between Goenoeng Raja and Tandjoeng Bajoeng, mud bottom. Northward of Tandjoeng Bajoeng the depths inside the 10-fathom curve are very irregular and there are dangerous ridges of hard ground extending from this point to a position about 6 miles northward of the Soengai Paloh. A spit, with depths of 1 to 3 fathoms, extends north-northeastward from Tandjoeng Bajoeng for a distance of about 14 miles. Its outer edge lies about 3/4 mile inside the 10-fathom curve. A shoal, with depths of 3/4 fathom to 3 fathoms, and a length of about 5 1/2 miles, lies about 1 mile northward of the northern extremity of this spit and about 5 miles westward of the entrance of the Soengai Paloh. A beacon marks the south end of its shoalest part. A 1 1/2-fathom patch lies about 1/3 mile southeastward of this beacon and a spit, with depths of less than 5 fathoms, extends about 3 miles north-northeastward from the northern end of the shoal.

**8-84 Soengai Paloh (1°46'N., 109°16'E.)**.—The entrance of this river lies between Tandjoeng Blimbing and Poelau Toea. The former is a long narrow point of land about 20 miles northeastward of Tandjoeng Bajoeng that terminates in a drying spit. In 1959, the point was extending south-southwestward. A flat, almost awash in places, extends about 1 mile westward from this point. The sea has cut two 1/3-mile-wide channels through the last two miles of Tandjoeng Blimbing. Poelau Toea lies about 1/2 mile south-eastward of Tandjoeng Blimbing. The island itself is low, but it is covered with very high trees. A drying flat extends about 1 mile westward and south-westward from this island, and from the north-western extremity of this flat a spit, almost awash in places, extends about 2 miles northwestward

and northward. A beacon, with a topmark of two black cones, and situated about 2 miles northwestward of Tandjoeng Blimbing, marks the outer end of this spit.

**8-85 Landmarks.**—Several mountains back the coast in the vicinity of Soengai Paloh, the highest of which are Goenoeng Belaoetoenggai, 1,640 feet high, which is situated about 11 1/2 miles eastward of Tandjoeng Blimbing, and Goenoeng Asoeansang, 1,968 feet high, and situated about 13 miles northeastward of Tandjoeng Blimbing.

**8-86 Channel.**—The channel leading into the Soengai Paloh is located eastward of the beacon marking the northern end of the spit extending northwestward from Poelau Toea. The channel is marked, but local knowledge is necessary because of its shifting nature.

The area in the vicinity of the Soengai Paloh is sparsely populated and the river is of little navigational importance. The mouth of the river is about 1/2 mile wide and this width is maintained as far as its junction with the Soengai Bemban, about 10 miles upstream. The Soengai Sekoejoe also joins the river at this point and the Soengai Tjermai, which has a small lumber village near its mouth, flows into the river about 2 miles downstream from its junction with the Soengai Bemban. There are no dangers in the Soengai Paloh and there is a least depth of about 20 feet from Poelau Bakau, a small islet off the southern bank, about 1 mile eastward of Tandjoeng Blimbing, to its junction with the Soengai Bemban. The Soengai Bemban, Soengai Tjermai and Soengai Sekoejoe are navigable for a distance of about 5 miles by vessels drawing not more than 12 feet.

**8-87 Tides.**—The character of the tides is mixed but predominately semi-diurnal. The lowest water level can be expected to average about 4 feet below mean level about March and April and about September and October and occurs close to those days having semi-diurnal spring tides. The highest water level can be expected to average about 2.8 feet above mean level on all days having a semi-diurnal spring tide.

**8-88 Tidal currents.**—The tidal currents are semi-diurnal. During rising tides and at high water a strong current sets in a south-south-west direction over the bar off the mouth of the river.

**8-89 Coast.**—From Tandjoeng Blimbing to Tandjoeng Moenggoeresak, about 10 miles north-northeastward, the coast curves inward forming a bight. During the northeast monsoon there is good landing on a firm sandy beach, free from rocks and sheltered from the surf, located about 1/2 mile southward of Tandjoeng Moenggoeresak. Tandjoeng Api, situated about 1 1/2 miles north-eastward of Tandjoeng Moenggoeresak, is a low sandy point covered with trees. The several high black rocks that stand on this point serve to identify it. Goenoeng Moenggoeresak, 229 feet high, and Goenoeng Tjermaj, 246 feet high, are situated respectively about 3/4 mile and 3 3/4 miles southeastward of Tandjoeng Api. Between Tandjoeng Moenggoeresak and Tandjoeng Api drying rocks extend offshore for a distance of nearly 1 mile. A **shoal**, 2 miles in length and with a least depth of 1 fathom, lies about 1 mile north-westward of Tandjoeng Api. This shoal is steep-to on its outer side.

**8-90 Anchorage.**—Good anchorage is available in a depth of about 14 fathoms, sand bottom, about 2 1/4 miles northwestward of Tandjoeng Api.

From Tandjoeng Api the coast is low and sandy and trends east-northeastward for a distance of about 20 miles to Tanjong Datu. A few rocks lie close offshore along this section of the coast. A shoal, with a least depth of 3 fathoms, lies about 2 miles northeastward of Tandjoeng Api.

A shoal with a least depth of 4 3/4 fathoms lies close within the 10-fathom curve in a position about 9 1/4 miles northeastward of Tandjoeng Api.

**8-91 Tanjong Datu** ( $2^{\circ}05' N.$ ,  $109^{\circ}39' E.$ ) is the termination of a mountainous peninsula projecting about 6 miles in a north-northeasterly direction from the coast. It is distinguished by two peaks, Mount Datu, 1,749 feet high, and Mount Malaka, 1,568 feet high, situated respectively about 2 and 3 miles southward of the point. Mounng Pangi,

1,150 feet high, is situated in the lower country about 5 1/2 miles southward of the point. The entire coastline of the peninsula terminating at Tanjong Datu is steep-to and is fronted by a reef, and by many above-water rocks. There are strong eddies off the point.

**Anchorage** can be obtained in depths of 6 to 8 fathoms about 1 mile off the western side of the peninsula.

A light is shown from Tanjong Datu.

**8-92 Niger Bank** is situated about 4 miles northward of Tanjong Datu. It is about 5 miles long in an easterly and westerly direction and about 1 3/4 miles wide near its western end. The bank has a least depth of 4 1/2 fathoms and depths around the bank are 11 to 17 fathoms.

Two 6-fathom patches lie about 2 miles west-southwestward and 1 3/4 miles southwestward of its shoalest head.

With north winds and the current setting northward there are tide rips over Niger Bank which from a distance resemble a surf. Between the bank and Tanjong Datu there is a channel about 2 1/2 miles wide with depths of over 10 fathoms.

**8-93 Api Passage.**—The channel separating the northwestern coast of Borneo and the Zuid Notoena Eilanden (see sec. 9-57) is known as Api Passage. It is deep and clear of dangers with the exception of two 29-foot patches lying respectively about 12 1/2 and 13 1/2 miles westward of Tanjong Datu. The passage is generally deeper at its northern end, where there are depths of 12 to 20 fathoms. Depths decrease to about 10 fathoms at the southern end of the passage.

Api Passage has been reported (1958) to be a good radar target at a distance of 28 miles.

**8-94 Tidal currents.**—About 2 miles north-westward of Tandjoeng Api the flood current sets east-northeastward and the ebb south-southwestward at a velocity of 2 to 2 1/2 knots.

## CHAPTER 9

### TOEDJOEH EILANDEN

**9-1 GENERAL REMARKS.**—All of the islands of Indonesia in the south portion of the China Sea, northward of the Equator, are known generally as the Toedjoeh Eilanden. This general group is divided into six smaller groups known as Badas Eilanden, Tambelan Eilanden, Anambas Eilanden, Zuid Natoena Eilanden, Natoena Eilanden, and Noord Natocna Eilanden. The entire group lies westward and northwestward of the west coast of Borneo. The closest group, the Zuid Natoena Eilanden, lies about 15 to 75 miles north-northwestward of the mainland, and the farthest group, the Anambas Eilanden, lies about 180 to 210 miles northwestward. The Badas Eilanden and the Tambelan Eilanden, the two southernmost groups, are fairly steep-to but the larger islands of the other groups are generally encumbered by coastal reefs extending some distance offshore. The best time to visit these islands is during the change of the monsoons, the spring change being preferable to that of autumn. During the monsoons many of these islands are inaccessible because of the heavy surf, and the probability of fair weather during these times is slight. Most of the islands are covered with dense vegetation, and in relation to their size are fairly high. Groot Natoena, the largest island in the group, attains an elevation of 3,395 feet and is a conspicuous landmark.

**Caution.**—Numerous logs, driftwood, roots of palm trees, etc., dangerous to shipping, maybe encountered between Natoena Islands and Balabac Strait (H.O. Pub. 92).

**9-2 BADAS (WATAS) EILANDEN.**—This group of islands lies off the west coast of Borneo about 100 miles west-southwestward of its western extremity. It consists of a number of hilly islands and rocks separated by deep channels but local knowledge is recommended for vessels navigating in the vicinity. The population is

small and the principal occupations of the inhabitants are fishing and coconut cultivation.

**Pedjamoe** ( $0^{\circ}31' N.$ ,  $107^{\circ}09' E.$ ), 138 feet high, is the southernmost island in the group. It is densely wooded and has a low sandy beach on its eastern side. A white rock is situated near the end of a reef that extends about 300 yards north-northeastward from the island. A bank with a least depth of  $7\frac{3}{4}$  fathoms lies about 2 miles east-southeastward of the island.

**Anak Awoer**, 311 feet high, is situated about  $10\frac{1}{2}$  miles west-northwestward of Pedjamoe. It is a generally rugged island but its southwestern side is sandy. It is fringed by a reef except on its eastern side, which is steep-to.

**Poelau Pinangseraboe**, 403 feet high, is situated about  $2\frac{1}{2}$  miles northward of Anak Awoer. There is a depression in the hills on its eastern and western sides, and from a distance north-northwestward or south-southeastward it appears as two islands. A reef extends about  $\frac{2}{3}$  mile from the northern side of the island. **Tokong Kangen**, a steep conical rock 128 feet high, lies near the northern end of this reef. An 11-fathom patch lies about  $\frac{3}{4}$  mile northward of Tokong Kangen. **Pinang Seratoes** is a high rock situated about  $\frac{1}{3}$  mile northeastward of the eastern end of Poelau Pinangseraboe; it lies near the southern end of a reef extending about 800 yards northwestward. A smaller rock lies about 275 yards northward of Pinang Seratoes. **Tokong Boeton**, an islet about 82 feet high, lies about 600 yards southward of Poelau Pinangseraboe, the channel between being deep.

**Poelau Kepahiang**, 827 feet high, is the largest and northernmost island of the group. It is about  $1\frac{1}{2}$  miles long, and is situated about 2 miles northeastward of Poelau Pinangseraboe. A small bay indents the eastern side of the island for a



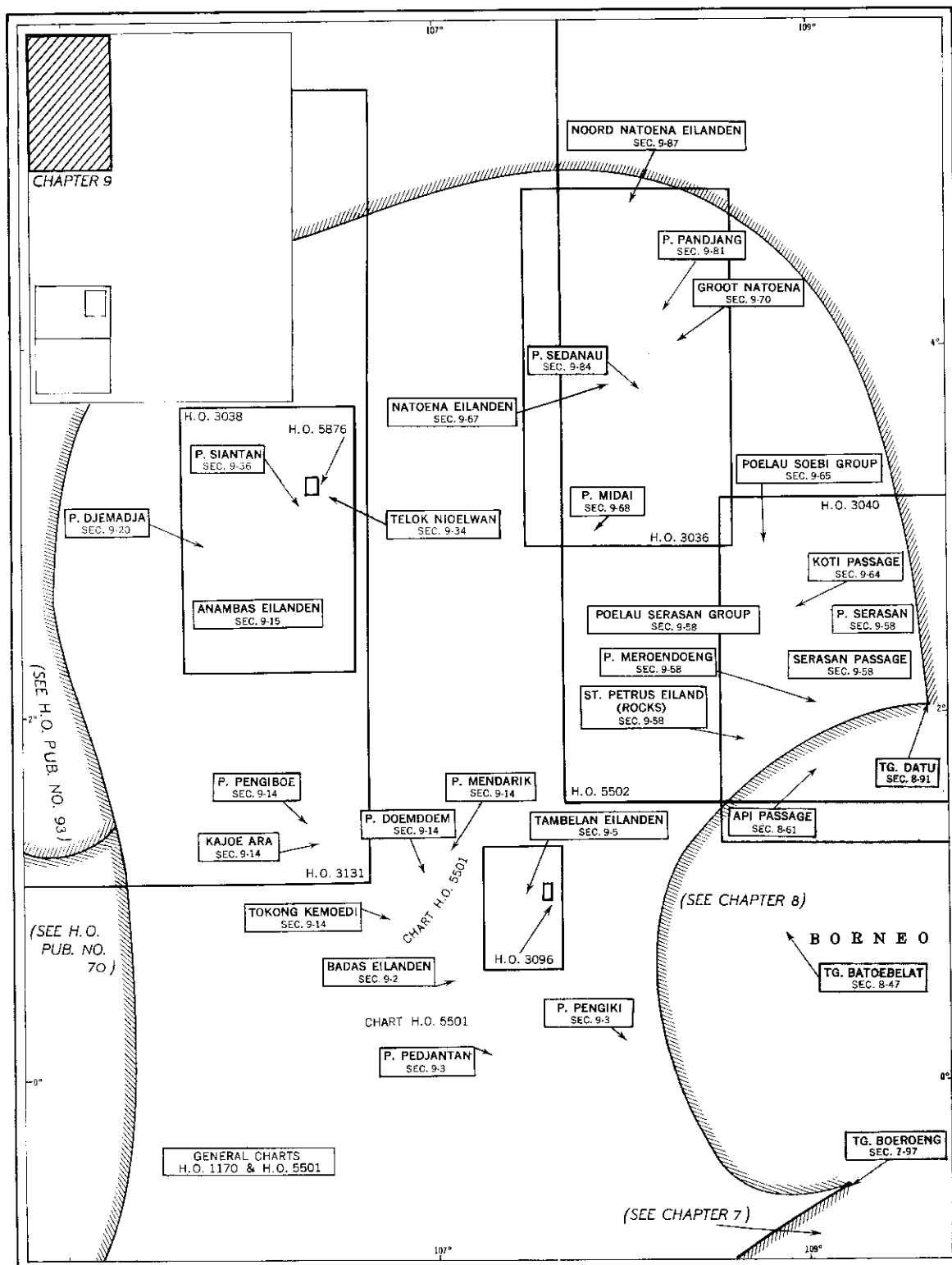


Chart limits shown are of the best scale charts issued to naval vessels by the U.S. Navy Hydrographic Office.  
Section numbers refer to the place in the text where a description of the designated locality begins.

## CHAPTER 9—GRAPHIC INDEX

•H. O. 71



distance of about 1/4 mile but is accessible only to native boats. A small Chinese settlement is situated here. Depths of less than 3 fathoms extend up to 1/4 mile from the northern and northeastern sides of the island. Segoen, 144 feet high, is an islet situated about 2/3 mile eastward of the southern extremity of Poelau Kepahiang. The southern end of this islet terminates in a sandy spit, on the extremity of which lies a rock 39 feet high. Most of the islet is overgrown with coconut trees. Several above-water rocks lie within 200 yards of the island.

A reef with a least depth of 1 fathom lies about 1 1/3 miles east-northeastward of Segoen. Depths of less than 10 fathoms extend about 1/4 mile north-northeastward and south-southwestward from the shoalest head of the reef. This reef is in range with the eastern point of Poelau Pinangseraboe and the 39-foot rock off the southern end of Segoen.

PENAOE, 620 feet high, and situated about 3 miles east-southeastward of Segoen, consists of two hills connected by a low narrow strip of land, the northern side of which is intended by a small bay for a distance of about 1/3 mile. Depths of less than 3 fathoms extend about 300 yards from the northern side of the island. A 6 1/2-fathom patch lies about 1/4 mile northward of the western end of the island. Batoe, an islet 315 feet high, lies about 1 1/4 miles southeastward of Penaoe. Depths of less than 3 fathoms extend about 300 yards westward from Batoe.

TEBON, an island 590 feet high, is the most important and the most populated island of the group. It is situated about 2 miles east-southeastward of Penaoe. Similar to Penaoe, it consists of two hills connected by a strip of low land. A small bay, fronted by a barrier reef, is situated on its northern side but is accessible only to native craft. Native villages are situated on the northern and southern sides of the island. Depths of less than 3 fathoms extend about 400 yards from the northern side of the island and about 200 yards from the remaining sides. A 5 1/2-fathom patch lies about 800 yards northwestward of the northern extremity of the island. A conspicuous white rock, 69 feet high, lies about 800 yards eastward of Tebon, and a bank with a least depth of 6 1/2 fathoms lies about 1/3 mile eastward of this rock.

PINANG KOENING (Brace Island), an island 387 feet high, is situated about 2 miles east-

ward of Tebon. Its southern end terminates in a low sandy point with a conspicuous rock on its end. The northern end of the island is encumbered by rocks that extend about 400 yards from the shore. A coral reef, with a least depth of 3 1/4 fathoms, lies about 1/2 mile westward of the island. Tanjaroe, an islet 374 feet high and situated about 2/3 mile southeastward of Pinang Koenig, has a reef extending about 400 yards from its northern side, and Mengegah, 325 feet high, is a steep-to islet situated about 400 yards eastward of Tanjaroe.

9-3 ISLANDS AND DANGERS EASTWARD AND SOUTHWARD OF BADAS EILANDEN.—Poelau Pedjantan (0°07' N., 107°13' E.) is situated about 26 miles southward of Pinang Koenig. It is somewhat triangular in shape, having a length of about 3 miles and a greatest width of about 2 1/3 miles. It is densely wooded and mountainous, the highest elevation, 748 feet, being near its northeastern end. A conical peak, 400 feet high, which rises steeply from the sea, is situated near its western point. Close westward of this point is an islet, 98 feet high, and about 200 yards westward of this islet is a group of above-water rocks. The northern side of the island recedes about 1/3 mile forming a bight, the shores of which are fringed by a reef. An islet lies on the eastern part of this reef. A rock with a least depth of 10 feet lies about 600 yards northward of this islet, and another rock with a least depth of 3 feet lies about the same distance westward. A small shoal with a least depth of 11 feet lies close to the latter rock. Three small bays, the southernmost of which is fringed by a reef to a distance of about 200 yards, indent the eastern coast of the island.

An islet lies close off the northeast extremity of the island.

POELAU PENGIKI, an island 649 feet high, lies about midway between Poelau Pedjantan and the western coast of Borneo. It is somewhat triangular in shape and has a reef extending as far as 200 yards from its sides; the ends, however, are steep-to. Pengiki Ketjil, an island 246 feet high and steep-to, lies about 700 yards westward of Poelau Pengiki. The northern end of the channel between these two islands is encumbered by a coral reef with a least depth of 6 fathoms. Both of these islands are covered with dense vegetation and are uninhabited.

**9-4 Anchorage.**—A good anchorage for vessels with local knowledge is available about 450 yards southwestward of the southern point of Poelau Pengiki in depths of 14 fathoms. This anchorage provides shelter from the violent squalls that occasionally occur during the northeast monsoon.

**Ebeling Shoal**, lying about 22 miles north-northeastward of Poelau Pedjantan, is a detached coral formation about 200 yards in diameter and with a least depth of  $1\frac{3}{4}$  fathoms. It is steep-to on all sides and cannot be seen.

**Welstead Shoal**, a group of pinnacles having a least depth of  $2\frac{3}{4}$  fathoms, lies about 20 miles north-northwestward of Poelau Pengiki. It is about 600 yards long and 200 yards wide, and cannot be seen. A detached shoal with a least depth of 6 fathoms lies about 400 yards westward of Welstead Shoal.

**Rodger Rock** ( $0^{\circ}41' N.$ ,  $107^{\circ}32' E.$ ), a dangerous rock with only 3 feet over it, lies about 22 miles east-northeastward of Pinang Koening. It is about  $11\frac{1}{2}$  miles  $184^{\circ}$  from the central summit of Mengirang Besar of the Tambelan Eilanden (see sec. 9-5) and on the alinement of that summit and the highest peak of Poelau Tambelan. There are depths of 20 fathoms or more as close as 200 yards from all sides of this rock.

**9-5 TAMBELAN EILANDEN** (*H. O. Chart 3096*).—The principal islands of this group are situated northeastward of the Badas Eilanden. Several other islands and rocks lie some distance westward and northwestward of the principal islands. A fairly clear channel divides the principal islands of this group into two smaller groups, and there is good anchorage throughout this channel. The total population of the Tambelan Eilanden numbers about 3,000 of which 2,000 reside on Poelau Tambelan, the largest island of the group.

**Djangkoelan** ( $0^{\circ}45' N.$ ,  $107^{\circ}19' E.$ ) is a low densely wooded island, about  $\frac{1}{3}$  mile long, with a conspicuous grove of trees near its center. It lies about 14 miles northeastward of Pinang Koening, in the Badas Eilanden, and about 13 miles south-southwestward of Poelau Benoca, the second largest island of the Tambelan Eilanden. It is surrounded by a reef that extends about 250 yards from its shore, which consists of a white sandy beach.

**Mengirang Besar**, an island 594 feet high, is situated about 15 miles northeastward of Djangkoelan. It is about  $1\frac{3}{4}$  miles long in a northerly and southerly direction and is fringed by a narrow coral reef. Mengirang Ketjil, a small hilly island, is situated about 1 mile westward of Mengirang Besar. The channel between these two islands is free of dangers. Mengirang Ketjil is surrounded by a reef that extends as far as 600 yards from its northerly end. Karang Sobatan, a coral reef having a length of about  $\frac{3}{4}$  mile and a least depth of  $2\frac{3}{4}$  fathoms, lies about  $\frac{1}{4}$  to 1 mile westward of Mengirang Ketjil. The highest peak of Poelau Tambelan in range  $24^{\circ}$  with the eastern extremity of Poelau Batong leads about  $\frac{1}{2}$  mile westward of Karang Sobatan, and Tokong Mengirang open southward of the southern extremity of Mengirang Besar leads southward of Karang Sobatan.

**Tokong Mengirang**, a conspicuous white rock about 80 feet high, is situated about 5 miles east-southeastward of Mengirang Besar. Foul ground extends about 400 yards westward and southwestward from this rock. Two pinnacle-shaped rocks, each about 12 feet high, stand near the southwestern edge of the foul ground.

**Poelau Benoca**, the second largest island of the group, is 940 feet high near its northeastern side, and is situated about  $4\frac{1}{2}$  miles northwestward of Mengirang Besar. It is nearly 4 miles long and about  $2\frac{3}{4}$  miles wide at its widest point. It is fringed by a reef that extends about  $\frac{1}{2}$  mile from its southeastern side.

Kapala Tambelan is an islet situated about 1 mile south-southeastward of Poelau Benoca. A bank, having a least depth of  $6\frac{1}{2}$  fathoms, lies about 1 mile southwestward of this islet.

**Poelau Selintang**, a conical-shaped island 681 feet high and having a narrow peninsula projecting from its northern end, is situated about 400 yards eastward of Poelau Benoca. It is fringed by a narrow reef, and is separated from Poelau Benoca by a narrow channel with a detached reef, awash, lying near its northern end. Two rocks, with depths of  $\frac{1}{2}$  and  $1\frac{3}{4}$  fathoms respectively, lie close off the northern end of the island, and a 2-fathom shoal lies about  $\frac{1}{3}$  mile north-eastward of the island.

**Poelau Djela**, 265 feet high, is an island about 1 mile long situated about 300 yards eastward of Poelau Selintang. The channel between these islands is deep and free of dangers, with the excep-

tion of the 2-fathom shoal and the rock with a depth of  $1\frac{3}{4}$  fathoms lying off the northern end of Poelau Selintang. A coastal reef fringes the island, which extends up to 300 yards offshore, except for the southeast side which is steep-to. Baroeng, an above water rock, about 400 yards northward of the west end of the island, is embraced by this reef.

Poelau Bedoea, an island 403 feet high, is located about  $1\frac{1}{4}$  miles eastward of Poelau Benoea. It is fringed by a reef, with depths of less than 18 feet over it, that extends nearly  $\frac{1}{2}$  mile southward. This reef embraces Poelau Oentoek, an islet nearly  $\frac{1}{2}$  mile long. Poelau Lipi, another islet, lies about 250 yards south-southwestward of Poelau Oentoek, from which it is separated by a deep but narrow channel.

Karang Tengah, with a least depth of 16 feet, sand, lies on a bank about  $\frac{3}{4}$  mile westward of Poelau Lipi. Depths of less than 36 feet extend about 800 yards northward from its shoalest part.

Poelau Batong, an islet 177 feet high, lies slightly more than  $\frac{1}{2}$  mile eastward of Poelau Bedoea and about  $1\frac{1}{2}$  miles westward of the southwestern extremity of Poelau Tambelan. The channels on both sides of this island are deep and free of dangers. Depths of less than 18 feet extend 200 yards northward from the island.

#### 9-6 Islands northwestward of Poelau Benoea.

—A group of ten islands and islets lie within a distance of  $4\frac{1}{2}$  miles northwestward of Poelau Benoea and is comprised of Leso, Poelau Nangka, Nimboeng, Poelau Iboel, 532 feet high, Poelau Peling, Poelau Tamban, 281 feet high, Poelau Pandjang, Poelau Lintang, Poelau Genting, and Moendaga, the westernmost, which is 697 feet high. These islands are hilly and with the exception of Poelau Genting are fringed by reefs. The reef that extends northward from Poelau Iboel connects this island with Poelau Tamban and this reef also extends in a northeasterly direction nearly to Poelau Peling. The channels between these islands are not recommended. Two shoals with depths of  $1\frac{3}{4}$  and 4 fathoms lie near the northern end of the channel between Poelau Iboel and Poelau Benoea, and other shoals may lie in the channel. Local knowledge is necessary for the safe

navigation of this channel. The channels between the rest of the islands in this group are deep and are considered to be generally free of dangers, excepting the channel between Leso and Poelau Benoea, which has a least charted depth of  $2\frac{3}{4}$  fathoms on the shoal that extends about 1,300 yards northward from the northeastern side of Leso. A rock, above water, lies on the outer end of a spit, with depths of less than 36 feet, about 500 yards southwestward of the south extremity of Leso Island.

Poelau Tambelan is the largest and most important island of the Tambelan Eilanden. Tandjoeng Mandi Angin, its southernmost point, lies about 2 miles eastward of Poelau Batong. The island is triangular in shape and has a greatest length of about  $4\frac{3}{4}$  miles. Bini, 1,300 feet high, is the highest peak on the island and is located about  $1\frac{1}{2}$  miles southeastward of Tandjoeng Anchoe, the northwestern extremity of the island. Kotit, a conspicuous thumb-shaped peak 953 feet high, lies about  $\frac{1}{3}$  mile eastward of Bini. Between Tandjoeng Anchoe and Tandjoeng Kemantau, the eastern extremity of the island, the coast is generally clear and free of reefs. Pilang Ketjil is an islet lying a few yards off the coast about  $2\frac{1}{4}$  miles east-southeastward of Tandjoeng Anchoe, and Pilang Besar, a somewhat larger islet, lies about  $\frac{1}{2}$  mile off the coast north-eastward of Pilang Ketjil. An above-water rock lies close northward of Pilang Besar.

A shoal with a least depth of  $3\frac{1}{4}$  fathoms lies about  $\frac{1}{2}$  mile north-northwestward of Tandjoeng Anchoe.

From Tandjoeng Kemantau to Tandjoeng Mandi Angin the coast is irregular and is fronted by a reef that extends as far as  $\frac{3}{8}$  mile offshore near Tandjoeng Kemantau. Batoe Rakit is a rock lying near the edge of the reef about  $\frac{1}{2}$  mile southward of Tandjoeng Kemantau. Between Tandjoeng Mandi Angin and Tandjoeng Anchoe the coast is fronted by a reef except in the entrance of Baai Tambelan, which is described below. Northwestward of the entrance of Baai Tambelan the coastal reef extends as far as  $\frac{5}{8}$  mile offshore. The islets of Kera and Betoende lie on this reef about 1 mile and  $1\frac{1}{2}$  miles respectively northwestward of the entrance of Baai Tambelan.

**9-7 Baai Tambelan.**—Poelau Tambelan is nearly divided into two parts by Baai Tambelan, which indents the southwest coast in a northeasterly direction to a distance of about  $2\frac{1}{2}$  miles. Tandjoeng Bertoempa, the south entrance point of the bay, is a narrow point of land about  $\frac{1}{3}$  mile northwestward of Tandjoeng Mandi Angin. Tandjoeng Ajam, located about  $\frac{1}{4}$  miles northward of Tandjoeng Bertoempa, is the termination of a peninsula that forms the northwest side of Baai Tambelan. Sakai, an above-water rock, lies close westward of Tandjoeng Ajam, and several other above-water rocks lie on the reef that extends about  $\frac{1}{2}$  mile south-southwestward from Tandjoeng Ajam. The bay is about  $\frac{1}{2}$  mile wide between Tandjoeng Ajam and Tandjoeng Sadap, which is located about  $1\frac{1}{4}$  miles north-northeastward of Tandjoeng Bertoempa. The general depths inside the bay to a position about 1 mile from its entrance are 6 to 10 fathoms. Within the 6-fathom curve the bay is reef-strewn and navigation is possible only for boats. A coral breakwater, through which there is a narrow boat channel, crosses the upper part of the bay about  $1\frac{1}{2}$  miles from its entrance. A fort is located near the northwestern end of this breakwater. About  $\frac{1}{4}$  mile northeastward of the breakwater the bay is divided into two arms by a peninsula about  $\frac{3}{4}$  mile long and  $\frac{1}{2}$  mile wide.

**9-8 Dangers.**—A pinnacle rock, with a least depth of 13 feet lies in the fairway about  $\frac{1}{4}$  mile south-southeastward of Tandjoeng Ajam. A small detached reef, about 2 feet above water, lies about  $\frac{1}{8}$  mile southeastward of Tandjoeng Ajam. A below-water rock lies about  $\frac{1}{4}$  mile northeastward of Tandjoeng Ajam, and a shoal, with a least depth of 13 feet, lies about midway between Tandjoeng Ajam and Tandjoeng Sadap. The outer edges of the reefs fringing Tandjoeng Sadap are marked by three white beacons with truncated cone topmarks. They are located 300 yards south-

westward, close westward, and 300 yards northward, respectively, of the point. Northward of the latter beacon, the bay is encumbered with numerous dangers.

**9-9 Anchorage.**—During the Northeast Monsoon vessels can anchor in the entrance of the bay about  $\frac{3}{8}$  mile southward of Tandjoeng Ajam in depths of 10 fathoms. This anchorage is unsafe during the Southwest Monsoon, at which time vessels with local knowledge can find better anchorage northwest of Tandjoeng Sadap in depths of 9 to 10 fathoms.

**9-10 Tides.**—The tides in Baai Tambelan are almost entirely diurnal. The mean height of the higher high water is about 3 feet, and the mean height of the lower low water is about  $1\frac{1}{2}$  feet.

**9-11 BATOE LEPOE ( $1^{\circ}00'N.$ ,  $107^{\circ}34'E.$ )** is a village located on the north shore of the bay in a position about 2 miles northeastward of Tandjoeng Ajam. The inhabitants are Malaysians, and their principal occupation is coconut collection. The population is about 500.

A pier, about 525 feet long, is located about 400 yards southwestward of Batoe Lepoe. The depth alongside this pier is about  $1\frac{1}{2}$  feet.

**Supplies.**—Hens, geese, and goats can be obtained in small quantities. Water is also available in small quantities.

**Communication.**—There is regular steamer communication with other ports of Indonesia.

**9-12 Alida Shoal ( $0^{\circ}59'N.$ ,  $107^{\circ}52'E.$ )**, with a least depth of  $1\frac{3}{4}$  fathoms, lies about 16 miles eastward of Poelau Tambelan. Its maximum width is about 175 yards, and it is steep-to on all sides. This shoal can be avoided by keeping the angle between the summit of Poelau Tambelan and the summit of Mengirang Besar less than  $023^{\circ}$  or more than  $025^{\circ}$ .

**9-13 Islands northwestward of Poelau Tambelan.**—Poelau Boengin ( $1^{\circ}02'N.$ ,  $107^{\circ}31'E.$ ), 285 feet high, is a small island situated about  $1\frac{1}{4}$  miles westward of the northwestern extremity of Poelau Tambelan. A reef with a least depth of 9 feet lies about  $\frac{1}{2}$  mile northeastward of this island, and two rocky patches with least depths of 4 fathoms lie respec-

tively about 300 and 900 yards southwestward. A shoal with depths of 2 fathoms lies close eastward of this island and two islets, Rakit and Djangkoelat, lie on this shoal. Except for the  $3\frac{1}{4}$ -fathom shoal north-northwestward of the northwest extremity of Poelau Tambelan, the channel between these two islands is free of detached dangers.

Sedoea Besar, 886 feet high, and Sedoea Ketjil, 650 feet high, are situated respectively about  $1\frac{1}{2}$  and  $2\frac{1}{2}$  miles northwestward of the northwestern extremity of Poelau Tambelan. The channel between these islands is deep and narrow but is encumbered by a  $2\frac{1}{2}$ -fathom shoal lying

near its northern end. The only dangers in the channel southeastward of Sedoea Besar are the 9-foot shoal northeastward of Poelau Boengin and the  $3\frac{1}{4}$ -fathom shoal north-northeastward of the northwestern extremity of Poelau Tambelan. Sedoea Besar and Sedoea Ketjil are steep-to in most places.

Sendoelang Besar, 792 feet high, and Sendoelang Ketjil, 300 feet high, lie about 3 miles northwestward of Sedoea Ketjil. These islands lie on the western and eastern ends, respectively, of a shoal with depths of less than 3 fathoms. Sendoelang Besar can be recognized by its conical shape.

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Poelau Oewi, 1,093 feet high, is an island about 1 3/4 miles long situated about 1 mile west-northwestward of Sandoelang Besar. A reef extends as far as 600 yards from its northeastern side and as far as 700 yards northward and southward from its eastern extremity. Rakit, an islet, lies within this reef about 450 yards southward of the eastern extremity of the island, and another islet lies within the reef about 1/2 mile north-northeastward of Rakit.

TOKONG BELAJAR, 124 feet high, is an islet situated about 11 1/2 miles northeastward of Poelau Oewi and about 11 miles northward of Poelau Tambelan. This islet is remarkable in that it consists of two large boulders standing on a flat rock. Shoal water with a least depth of 4 fathoms extends about 400 yards southward from this islet.

KARANG LAOET, a shoal with a least depth of 23 feet, lies about 4 1/2 miles north-northeastward of Poelau Oewi. It is nearly 3/4 mile long, and there are depths of 11 to 20 fathoms close around. The sea does not break over this shoal.

A dangerous sunken rock has been reported (1958) to lie about 4 1/2 miles northward of Poelau Oewi and 2 1/4 miles westward of Karang Laoet. This position is approximate.

TOKONG OEWI, situated about 11 miles northwestward of Poelau Oewi, consists of several barren rocks standing on a reef nearly 1/2 mile long. The largest of these rocks are 113 and 93 feet high respectively. The reef surrounding these rocks is steep-to, and has a least depth of 16 feet.

**9-14 ISLANDS AND DANGERS WESTWARD AND NORTHWESTWARD OF THE TAMBELAN EILANDEN.**—POELAU MENDARIK (1° 19' N., 107° 02' E.), 364 feet high, is an island situated about 13 miles northwestward of Tokong Oewi. It consists of two hills connected by a low ridge and has sandy beaches on its east and west sides. Its north and south sides are rocky and rise steeply from the sea. A narrow reef fringes the east side of this island.

POELAU DOEMDOEM, an island 623 feet high, is situated about 11 1/2 miles southwestward of Poelau Mendarik. This island rises steeply from the sea and is densely wooded. There is a sandy beach on its southern side.

TOKONG KEMOEDI, an island nearly 3/4 mile long, lies about 18 miles south-south-

westward of Poelau Doemdoem. It consists of two hills, connected by a low densely wooded ridge, the northern of which is 576 feet high and rises almost perpendicularly from the sea. The southern hill is about 384 feet high. The northeastern side of the island is fringed by a narrow reef that extends about 100 yards from the southeastern extremity of the island. A rock, 121 feet high and shaped somewhat like a sugar loaf, stands on the edge of the reef near this point. There are sandy beaches on the northeastern and southwestern sides of the island.

KAJOE ARA (1° 32' N., 106° 27' E.), a whitish barren rock 76 feet high, lies about 34 miles northwestward of Poelau Doemdoem. It is steep-to on all sides and has depths of 30 fathoms or more as close as 200 yards around it. An above-water rock lies several yards off its south side.

Kajoe Ara was reported (1958) to be a good radar target at a distance of 8 miles.

PENGIBOE, 315 feet high, is a small densely wooded island situated about 8 miles west-northwestward of Kajoe Ara. This island is a good landmark for vessels proceeding from Singapore Strait to the northwest coast of Borneo.

The island has been reported (1958) to be a good radar target at a distance of 17 miles.

HUGHES SHOAL, with a least depth of 3 1/4 fathoms, lies about 2/3 mile southwestward of Pengiboe, from which it is separated by a deep channel. It has a greatest length of about 800 yards.

ACASTA ROCK lies about 4 miles north-northwestward of Pengiboe and has a least depth of 1/4 fathom over it. In calm weather it can only be distinguished by the discoloration of the water, but it breaks in the slightest swell.

A shoal depth of 7 fathoms exists about 1 3/4 miles, 125° from the island.

A 10-fathom patch lies about 38 miles southwestward of Pengiboe.

**9-15 ANAMBAS EILANDEN.**—This group of islands lies in the south part of the China Sea approximately midway between the westernmost point of Borneo and the east coast of the Malay Peninsula. Vessels bound from Singapore to Hong Kong usually pass westward of this group. The southeasternmost island of the group lies about 188 miles northwestward of the westernmost point of Borneo

and about 61 miles northward of Pengiboe in the Tambelan Eilanden. All islands in the Anambas group are extremely hilly; most are densely wooded and many are inhabited. The forests of these islands supply a high grade of timber, and many coconut trees are under cultivation. Most of these products are exported to Singapore.

The Anambas Eilanden are divided into two groups. Poelau Djemadja, 1,530 feet high, is the largest island of the southwestern group, and Poelau Siantan, 1,855 feet high, is the largest island of the northeastern group. In general, all of the Anambas Eilanden northward and eastward of Poelau Siantan are included in the northeastern group and all the others comprise the southwestern group.

These islands form a part of the residency of Riouw and are in charge of a government official residing at the village of Terempa, on Poelau Siantan. In 1964 the population of the Anambas Eilanden was about 12,000, and consisted principally of Malaysians and Chinese.

**9-16 CHANNELS—CAUTION.**—The wider passages between the various islands in this group are generally free of dangers, but the narrower channels should be avoided, since most of these have not been completely surveyed.

**FLOATING ISLANDS.**—Masses of grass, small trees, and other debris from the rivers are sometimes encountered in the vicinity of these islands. Some of these so-called floating islands attain considerable size.

**9-17 TIDES.**—The character of the tide is mixed, but predominately diurnal. Semi-diurnal tides occur only during March and September, and when the moon's declination is near its minimum.

**9-18 TIDAL CURRENTS.**—The tidal currents are diurnal. They are strongest at the moon's greatest declination but are weak and irregular when the moon's declination is near its minimum. Except in the narrow

channels between the islands, the currents set in a general southwesterly and northeasterly direction, but, as may be expected, they are influenced by the prevailing monsoon. Their greatest velocities are between 1 and 2 knots.

**9-19 SOUTHWESTERN GROUP—OUTLYING ISLANDS AND DANGERS.**—Damar (2° 45' N., 105° 23' E.) is a steep-to almost barren rock, 270 feet high. It lies about 20 miles west-southwestward of Poelau Djemadja, the largest of the southwest group. The bold sides of this rock are almost covered by guano, and there are coves on its northeast and southwest sides where landings can be made in good weather.

A rock, with less than 6 feet over it, lies close southward of Damar.

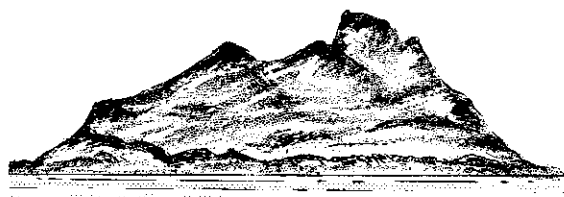
Kataoka Rock, a coral reef, lies about 19 miles south-southeastward of Damar. It is about 800 yards in extent, and has a least known depth of 4 3/4 fathoms, although less water may exist.

Tokong Malangbiroe, the southwesternmost island of this group, lies about 29 miles south-southeastward of Damar. It is a white rock, 111 feet high and almost barren. The rock is steep-to all around except near its southwestern extremity, where shallow water extends for a short distance.

Poelau Repong, a small island 695 feet high, is situated about 37 miles southeastward of Damar. It is circular in shape and densely wooded. The two peaks on the island form a high saddle, the east peak being the higher. Poelau Repong was reported (1957) as giving a good radar echo at a distance of 20 miles. The southern and eastern sides of the island are steep-to. The 6-fathom curve lies about 1/2 mile off its western side.



POELAU REPONG BEARING 110°, 4 MILES



POELAU REPONG BEARING NORTH, 6 MILES

POELAU BAWAH is a group of two small islands and several rocks lying about 12 1/2 miles northeastward of Poelau Repong. This group lies on an almost continuous reef about 2 miles long and fairly steep-to. The northern and larger island has a wooded summit, 440 feet high. A pyramidal-shaped rock, 220 feet high, lies close off the northern end of this island. The southern island is 410 feet high and is connected to the northern island by a reef having several low bushy rocks on its edge.

9-20 POELAU DJEMADJA is the largest and most important of the islands in the southwestern group. Tandjoeng Lelan, its southernmost point, lies about 21 miles east-northeastward of Damar. The island is about 15 miles long in a northerly and southerly direction and about 10 miles wide at its widest part. It is densely wooded and mountainous. Toedjoeh, its highest mountain, attains an elevation of 1,530 feet, and is conspicuous from any direction. Datoe and Adong are conspicuous peaks located in the northern part of the island. The former, 1,480 feet high, rises to a sharp peak, and the latter, 1,420 feet high, has a rounded appearance when viewed from the eastward or westward but appears as a sharp peak when viewed from the northward. The various mountains in the central and southern parts of the island, although many of them are more than 1,00 feet high, are more uniform in outline and not as conspicuous as those described above. The coastline of the island is very irregular and is indented by numerous bays and inlets.

9-21 Western coast of Poelau Djemadja.—Tandjoeng Lelan (2°49' N., 105°44' E.) is the southern extremity of the island. The hills slope gradually down to this point. A flat-topped rock, 20 feet high, lies close southeastward of the point. Tandjoeng Dajang, terminating in two small points projecting northwestward and southwestward respectively, is situated about 3 miles northwestward of Tandjoeng Lelan.

Margesson Shoal, usually marked by tide rips, lies about 5 miles westward of Tandjoeng Dajang. The shoal is composed of sand and coral, and consists of two portions; the northern has a depth of 7 fathoms over it, and the southern a depth of 5 fathoms.

Poelau Daroe, a wooded island about 1 mile in diameter and 635 feet high, lies close offshore about 3 1/2 miles northward of Tandjoeng Dajang. Poelau Katoekan, an islet 110 feet high, lies close westward of Poelau Daroe. The channels between Poelau Katoekan and Poelau Daroe, and between Poelau Daroe and the western coast of Poelau Djemadja can be navigated only by native boats.

Poelau Sibrong is an island lying close offshore about 2 1/4 miles north-northeastward of Poelau Daore. It is about 1 1/3 miles long and has two conspicuous peaks, 580 and 345 feet high, respectively, near its southeastern and northwestern ends. Poelau Toelai, an islet 265 feet high, lies about 1/2 mile off its northwestern end. Courier Patch, with a least depth of 6 fathoms, lies about 1 1/2 miles west-northwestward of Poelau Toelai.

Tandjoeng Djoelan is a high point of land that projects from Poelau Djemadja in a west-northwesterly direction for about 1 mile. Its extremity is situated about 1 1/4 miles north-northwestward of Poelau Toelai. Ipan, an islet 80 feet high, lies about 1/4 mile west-northwestward of Tandjoeng Djoelan, from which it is separated by a deep channel. A smaller islet lies close southward of Ipan.

REEDE LETONG is the name given to a roadstead lying between Tandjoeng Djoelan on the northward and Poelau Sibrong and Poelau Toelai on the southward. This roadstead indents the western coast of the island to a distance of about 1 mile, and the width of Poelau Djemadja at this point is only about 2/3 mile. A reef extends in a southeasterly direction from the northern shore of the roadstead for a distance of about 3/4 mile and embraces the islet of Berala, which is situated about 1/2 mile eastward of Poelau Toelai.

A red can buoy, surmounted by a red cylindrical topmark, lies about 1/2 mile east-southeastward of the southern extremity of Poelau Toelai, and marks the southern edge of the reef.

A detached reef, with a depth of 1 1/2 fathoms, lies about 1/3 mile southeastward of Berala. Anchorage is available between Berala and Poelau Toelai in depths of 9 to 11 fathoms.

A passage marked by unofficial beacons leads to the pier at Letong.

9-22 LETONG is a village situated on the northeastern shore of the roadstead in a position about 1/2 mile eastward of Berala, with a population (1962) of 1000. It is visited regularly by Dutch and Chinese vessels from Singapore. There is a wooden pier at this village.

9-23 Northeastern coast of Poelau Djemadja.—The northern end of the island consists of two peninsulas projecting in a northwesterly and northeasterly direction. The former is high, and has a reef extending about 1/2 mile northwestward from it. The latter terminates at Tandjoeng Mingga, a prominent cape 350 feet high, that is connected with the more elevated regions southward by a low narrow strip of land. When seen from a distance this cape appears as an islet. There is good anchorage in the bay between these two peninsulas in a position about 1 mile westward of Tandjoeng Mingga in 16 fathoms, sand, out of the strength of the tidal currents.

The eastern extremity of Poelau Djemadja consists of a peninsula with a greatest width of nearly 2 miles that terminates in two points. Tandjoeng Pinanang, the northern point, is situated about 7 1/2 miles southeastward of Tandjoeng Mingga, and Tandjoeng Djeboeng, the southern point, lies about 1 3/4 miles southward of Tandjoeng Pinanang. An islet, 145 feet high, lies about midway between these points, and a chain of detached reefs extends southward from this islet to Tandjoeng Djeboeng. Poelau Pinanang, an islet 270 feet high and densely wooded, lies about 1 1/4 miles north-northwestward of Tandjoeng Pinanang.

9-24 TELOK MAMPO is a large bay that indents the northeastern coast of the island to a distance of nearly 4 miles. Its entrance, which is about 3 1/2 miles wide, lies between Tandjoeng Mingga and Poelau Ajam, an islet 500 feet high, situated about 2 1/2 miles west-northwestward of Tandjoeng Pinanang and about 1/4 mile off a mainland point, to which it is connected by a drying reef. Poelau Goembong, an island 320 feet high, and Hoedang, an islet, stand on a detached reef in the northern part of the bay in a position about 3/4 mile south-southeastward of Tandjoeng Mingga. The shore at the head of the bay consists of a white sandy beach. Foul ground, with depths of less than 6 fathoms, extends from this shore to a distance of about 1 mile. A detached 3-fathom

patch lies outside the foul ground in a position about 2 1/2 miles southward of Poelau Goembong. The general depths in the outer part of the bay are 13 to 15 fathoms, but they gradually decrease up to the 6-fathom curve. Anchorage is available near the center of the bay about 2 1/2 miles westward of Poelau Ajam in 11 fathoms, sand and gravel bottom. As this bay is open to the northeastward, it does not afford safe anchorage during the Northeast Monsoon.

9-25 Southeastern coast of Poelau Djemadja.—The shores of this section of the coast are rocky and steep, and are indented by numerous bays and inlets that are navigable only by small craft. There are several sandy beaches along this coast that are backed by groves of coconut trees.

Telok Djeboeng, lying southwestward of Tandjoeng Djeboeng, is a fairly large bay. It is fringed by a reef that extends as much as 1/2 mile offshore. Two islets lie on the reef just southward of Tandjoeng Djeboeng. This bay affords good anchorage near its center in a position about 1 1/2 miles southwestward of Tandjoeng Djeboeng in 9 to 10 fathoms, sand bottom.

Tandjoeng Linang, a point situated about 4 1/2 miles south-southwestward of Tandjoeng Djeboeng, is the southern entrance point of Telok Koeala, a narrow inlet forming the mouth of the Soengai Seloebong. The village of Koeala is located on the north side of this inlet about 1 1/2 miles from its entrance. Koeala consists of about 30 houses on piles, and a wooden jetty. Drinking water can be obtained at this village. Good anchorage is available in the entrance to this inlet in a position about 3/4 mile northward of Tandjoeng Linang in about 13 fathoms, sand bottom. Small vessels with local knowledge can anchor farther in.

Several unofficial beacons mark the edges of the reef extending from the shore; isolated dangers are marked by buoys. A conical buoy, painted in black and white checkers, and surmounted by a black conical topmark, is moored a little over 3/4 mile north-northwestward of Tandjoeng Linang. A black conical buoy is moored about 1/4 mile farther westward.

Telok Tiroe is a large bay lying between Tandjoeng Linang and Poelau Dajong, an islet 115 feet high, situated about 4 miles southwestward. This bay is divided into two parts, but is so encumbered by reefs that it is of no navigational importance. Two-fathom patches

lie about  $3/4$  mile northward and  $1\ 1/4$  miles southward, respectively, of Poelau Dajong. Poelau Poenisan, an island 400 feet high, is situated in the north part of the bay about  $1/2$  mile offshore and  $1\ 3/4$  miles west-southwestward of Tandjoeng Linang. Anchorage is available in the entrance to Telok Tiroe in a position about 1 mile north-northeastward of Poelau Dajong in depths of 14 fathoms, sand and mud bottom.

WESTACOTT BANK, with a least depth of 7 fathoms, lies about  $4\ 1/4$  miles southeastward of Tandjoeng Djeboeng.

9-26 ISLANDS NORTHWARD AND NORTH-WESTWARD OF POELAU DJEMADJA.—Poelau Impoel is an island situated about 1 mile off the northern extremity of Poelau Djemadja. It is about  $2\ 1/2$  miles long, and has a sharp conspicuous summit, 1,180 feet high, situated near its center. A rock, with less than 1 fathom over it, lies close off the southern extremity of the island. Between the southern and southeastern extremities of the island the coast recedes forming a bight. An islet, 130 feet high and surrounded by a reef, lies close off the northeastern shore of the bight, and a reef, barely awash at high water, lies about  $1/4$  mile southward of this islet.

Poelau Anak, an island 640 feet high, lies about  $1/4$  mile northwestward of Poelau Impoel. Several above-water rocks lie close off the northwestern extremity of this island, and two islets, 180 and 205 feet high, lie respectively about  $1/3$  mile northward and  $2/3$  mile northwestward of the northwestern extremity of the island. The latter islet is fringed by a reef.

Poelau Moeboer is an island situated about  $2/3$  mile westward of Poelau Anak. A ridge of round hills, the highest of which is 810 feet, stands near the northern coast of this island.

Poelau Datoe is a small island, 350 feet high, that lies about  $1/4$  mile southward of the southeastern extremity of Poelau Moeboer.

Poelau Kramoet, 370 feet high, is an island lying close southwestward of Poelau Moeboer, and is joined to it by a mangrove swamp, through which there is a channel suitable only for small boats.

A bay, encumbered by foul ground, lies between the southeastern extremities of Poelau Kramoet and Poelau Moeboer. Vessels

can obtain anchorage in the outer part of the bay in a position about  $1/4$  mile eastward of the southeastern extremity of Poelau Kramoet in depths of 20 fathoms, sand and rock bottom. At the head of this bay lies the village of Kramoet, which is partly on Poelau Kramoet and partly on Poelau Moeboer, the two portions being connected by a footbridge. It is conspicuous from seaward because of the metal roofs on its buildings. There is a channel leading to this village that is marked by unofficial beacons, and vessels having local knowledge can anchor off this village.

9-27 POELAU MANGKAI ( $3^{\circ}\ 05'\ N.$ ,  $105^{\circ}\ 36'\ E.$ ), the northwesternmost of the islands in the southwestern group of the Anambas Eilanden, is situated about 2 miles west-southwestward of Poelau Kramoet. The channel between them is deep and free of dangers. This island is about  $1\ 1/2$  miles long and has an almost uniform height of 575 feet. It is densely wooded. Mangkai Ketjil, an islet 200 feet high, lies close southeastward of Poelau Mangkai, to which it is connected by a reef that uncovers at low water. The coasts of both islands are fairly steep-to.

A light is shown from a white iron framework tower situated on a summit near the center of Poelau Mangkai.

Caution.—Poelau Mangkai Light is frequently obscured by heavy rain squalls, and because of the variable nature of the southerly current, vessels approaching Poelau Mangkai from the northward during the northeast monsoon may be ahead of their reckoning. The light is obscured, except in Impul Passage, by islands from  $239^{\circ}$  through west to  $338^{\circ}$ . It is also intermittently obscured westward of the island within  $1\ 1/2$  miles, and eastward of the island within  $3\ 1/4$  miles.

9-28 IMPOEL PASSAGE is the name given to the channel between Poelau Djemadja and the islands northward and northwestward of it that are described above. It is about 1 mile wide at its narrowest part, and the only detached dangers are McCaulay Bank, with a least depth of 5 fathoms, lying about  $1\ 3/4$  miles west-northwestward of the northwestern extremity of Poelau Djemadja, and Bunker Patch, with a least depth of 5 fathoms, lying nearly 1 mile southeastward of the

southeastern extremity of Poelau Impoel. The highest peak of Poelau Telaga (see sec. 9-29) in range  $91^{\circ}$  with the southern extremity of Poelau Impoel leads about  $1/4$  mile northward of McCaulay Bank, and a tangent on the southeastern side of Poelau Impoel bearing  $69^{\circ}$  and open northward of the northwestern extremity of Poelau Djemadja leads about  $2/3$  mile southward of this danger. A tangent on the northern side of Poelau Mangkai bearing about  $280^{\circ}$  and open southward of Poelau Impoel leads about  $1/4$  mile southward of Bunker Patch.

A shoal, with a depth of 9 fathoms, lies in Impoel Passage about  $1\frac{1}{2}$  miles northward of Tandjoeng Mingga.

The tidal currents set eastward and westward through Impoel Passage with a greatest velocity of about  $1\frac{1}{2}$  knots.

9-29 ISLANDS NORTHEASTWARD AND SOUTHEASTWARD OF POELAU DJEMADJA—Poelau Telaga group.—Poelau Telaga ( $3^{\circ} 04' N.$ ,  $105^{\circ} 59' E.$ ), an island about 4 miles long, is situated about 8 miles northeastward of the eastern extremity of Poelau Djemadja. The island consists of a ridge of densely wooded hills, the highest of which is situated near its northern end and is 1,740 feet high. The island is fringed by a reef that extends as far as  $1/2$  mile southward from its southwestern extremity. A rocky islet stands on the edge of the reef off this point. Foul ground extends about  $1/3$  mile from its southern extremity. There are several villages on this island, most of them being situated on its western side.

POELAU BOETON, a narrow island 360 feet high, lies about  $2/3$  mile westward of the southern part of Poelau Telaga. A reef, with several above-water rocks on it, extends about  $1/3$  mile from the southern end of the island, and another reef extends northward from the island for a distance of almost  $3/4$  mile. Poelau Dinkor, a white-colored rock, stands on this reef in a position about  $1/2$  mile northwestward of the northern end of the island. A detached drying reef, about  $2/3$  mile in extent, lies about  $1/4$  mile northwestward of the extremity of the reef extending from the northern end of the island. There is a deep channel between these reefs leading to an anchorage off the western coast of Poelau Telaga, but local

knowledge is recommended for vessels using either this channel or the anchorage.

A group of four small islands lies close off the northwestern side of Poelau Telaga. Telaga Ketjil, 585 feet high, is the largest of this group, and the others are Poelau Lima, 475 feet high, Poelau Pasoe, 250 feet high, and Poelau Midai. Poelau Lima and Telaga Ketjil are joined together by a reef, as are Poelau Midai and Poelau Pasoe. There is a deep channel between Poelau Telaga and Poelau Midai, and a very narrow passage leads between Telaga Ketjil and Poelau Lima on the westward and Poelau Midai and Poelau Pasoe on the eastward, but neither of these channels is recommended.

Tokong Blinaoe, a rock 6 feet high, lies about  $2\frac{3}{4}$  miles westward of the southwestern extremity of Telaga Ketjil. Foul ground extends for a distance of about  $1/2$  mile northward, eastward, and southward from this rock.

POELAU DOERAI, an island 500 feet high, is situated about 15 miles north-northeastward of the northern extremity of Poelau Telaga. It is about  $3/4$  mile long and is densely wooded. Several rocks, with less than 1 fathom over them, lie close off the northwestern end of the island, and a group of dangerous below-water rocks lie about  $3/4$  mile northwestward of the island. Batoe Mamong, a rock 5 feet high, lies about  $1/2$  mile off the southwestern coast of the island.

Tokong Nannas, a rock 70 feet high, is situated about  $5\frac{1}{2}$  miles westward of Poelau Doerai. A narrow steep-to coral reef, bounded by the 6-fathom curve, extends about 1 mile west-southwestward from this rock.

9-30 POELAU GENTING OENJOET GROUP.—Poelau Genting Oenjoet, an island about 2 miles long, is situated about  $10\frac{1}{2}$  miles south-southeastward of Poelau Doerai. A ridge of wooded hills, the highest of which is 960 feet, extends along the center of this island. This island is fairly steep-to except off its northern end, where a reef extends for a distance of about  $1/3$  mile. A rock, 5 feet high, stands on this reef. A small bay indents the northern part of the eastern coast of the island to a distance of about  $1/2$  mile.

Poelau Lingai, a pear-shaped island 950 feet high, lies nearly 1 mile east-southeastward of Poelau Genting Oenjoet. Poelau Semisak, 450 feet high, lies close off the northern end of Poelau Lingai, and Poelau Moesoeh, 395 feet high, lies close off its southern end. Both of these islets are connected to Poelau Lingai by reefs.

Poelau Nawan, an islet 270 feet high, lies about 1 mile eastward of Poelau Lingai. Shoal water, with depths of less than 6 fathoms, extends westward from this island nearly half way to Poelau Lingai.

Karang Singka, a rock awash, lies on a coral patch about 1 1/4 miles north-northeastward of Poelau Nawan. Shoal water extends northward and westward from this rock for a distance of about 1/4 mile and southward for a distance of about 1/2 mile as limited by the 6-fathom curve.

Barnes Patch, with a least depth of 7 fathoms, sand and coral, lies about 2 miles south-southeastward of Poelau Nawan.

**9-31 POELAU TELIBANG GROUP.**—Poelau Telibang, an island about 1 3/4 miles long, is situated about 7 miles southward of Poelau Nawan. Its wooded summit, 610 feet high, is near its northern end. It is fringed by a narrow reef except near its northeastern end. Poelau Dikar, an islet 350 feet high, lies about 1/2 mile westward of the island and stands on an irregular-shaped reef that extends north-northeastward from the islet for a distance of nearly 1 mile. The reef also extends westward from the islet for about 1/2 mile, and several above-water rocks lie on this part of the reef. Several detached reefs lie within 3/4 mile of the northern side of the islet. A 3-fathom patch lies about 1 1/8 miles north-northeastward, and a 5-fathom patch lies about 3/4 mile northwestward of the islet. There is a narrow boat channel between Poelau Telibang and the reef extending north-northeastward from Poelau Dikar.

Loebang Tamban, 525 feet high, and Poelau Oedjoeng, 505 feet high, are islands lying respectively about 1 1/4 and 2 1/2 miles southeastward of the southern extremity of Poelau Telibang. Each is about 1 mile wide, and is surrounded by a coastal reef. Several

detached reefs lie close off the western side of Loebang Tamban, and a rock stands on the extremity of the reef that extends 1/4 mile southward from the southeast end of Poelau Oedjoeng for a distance of about 1/4 mile. A narrow channel separates these two islands, both of which are inhabited.

TALOJAN, an islet 285 feet high, lies about 5 miles northeastward of Poelau Telibang and about 3 1/2 miles west-southwestward of the southern extremity of Poelau Siantan, the largest island is the northeastern group of the Anambas Eilanden.

Bennet Rock, with a depth of 2 fathoms, lies nearly 1 mile eastward of the southern extremity of Talojan, and a 5-fathom coral patch lies about 1 1/4 miles east-northeastward of the islet.

Poelau Boean, a wooded islet 250 feet high, lies about 5 1/2 miles eastward of Poelau Telibang. A detached reef, parts of which are above water, lies close off its western side. Its eastern side is fringed by a reef that extends as far as 1/3 mile offshore. Two rocks stand on this reef, the higher of which is 14 feet.

Pascoe Rock, with a depth of 3 fathoms, lies about 2 miles east-northeastward of Poelau Boean.

**9-32 POELAU TEMIANG GROUP.**—Poelau Temiang, an island about 2 1/4 miles long, is situated about 2 1/4 miles southward of Poelau Telibang. The central part of this island is rather low, but there are broad flat-topped hills near either end. The hill near the western end is the higher and attains an elevation of 860 feet. The island is surrounded by a coastal reef that extends as far as 1/4 mile from its southeastern extremity. An islet stands near the edge of the reef near this point. A village is situated on the northeastern side of this island. The channel between Poelau Temiang and the islands northeastward of it is clear and free of dangers.

Poelau Mangkoedoe, 100 feet high, and Telaga Tjina, 130 feet high, are islets lying respectively about 3/4 mile and 1 mile off the southeastern extremity of Poelau Temiang, and are connected by a reef. The

narrow channel through this reef between the islets is completely foul. A detached reef, with a head above water, and about 1/4 mile in extent, lies in the channel between Poelau Mangkoedoe and Poelau Temiang. Two smaller islets stand on the reef close southward of Poelau Mangkoedoe, the outer one being 85 feet high. A small detached drying reef lies 1/4 mile southwestward of the 85-foot islet.

Mangkait, an islet 145 feet high, lies about 1 1/4 miles southwestward of the southeast extremity of Poelau Temiang and about 1 mile west-northwestward of Telaga Tjina. Mangkait was reported (1957) as giving a good radar echo at a distance of 26 miles. A narrow reef projects in a west-northwesterly direction from this islet for a distance of about 1/4 mile.

Poelau Mentanjoe, 325 feet high, and Poelau Genting, 315 feet high, are small islands situated respectively about 3 and 4 1/2 miles southward of the western extremity of Poelau Temiang. Poelau Genting is surrounded by a narrow reef, and Poelau Mentanjoe has a reef nearly 3/4 mile wide that extends in a northeasterly direction for a distance of about 1/2 mile. An islet stands near the northern edge of this reef. The channel between Poelau Mentanjoe and Poelau Mangkait is about 1 1/4 miles wide and is free of dangers.

A patch of coral and sand, with a depth of 13 fathoms, lies nearly 2 miles westward of the south end of Poelau Genting.

POELAU SERAK, a small wooded island 405 feet high, lies about 10 miles southwestward of the southwestern extremity of Poelau Temiang and about 6 3/4 miles southwestward of Poelau Mentanjoe. It is surrounded by a narrow reef and is steep-to, except off its northern and southern sides, where shoal water extends for a distance of about 1/8 mile.

9-33 POELAU AIRABOE GROUP.—Poelau Airaboe is a large island, the northwestern extremity of which is situated about 7 miles south-southeastward of Poelau Temiang. It is nearly 6 1/2 miles long and about 3 1/4 miles wide at its widest part. It consists of a ridge of hills, the highest of which, located near its northwestern extremity, attains an elevation of 1,595 feet, and is conspicuous from all directions. Another prominent peak

with flat-topped summit 1,580 feet high, is situated near the center of the island. The northern side of the island is fronted by a reef, and its eastern side is indented by several small bays. A rock awash lies about 1/3 mile eastward of the easternmost extremity of the island, and a 4-fathom patch lies close northward of this rock. A reef extends in an east-northeasterly direction from the southeastern extremity of the island for a distance of about 1/2 mile and a 3-fathom patch lies about 7/8 mile northeastward of the extremity of this reef.

A bay, the head of which is foul, indents the northern part of the western coast of the island to a distance of about 1 1/2 miles. A reef having an islet on it extends in a northwesterly direction from the southern entrance point of the bay for a distance of about 1/2 mile. A 6 1/2-fathom patch was reported (1950) to lie about 1 3/4 miles northwestward of this point. Vessels having local knowledge can anchor in the middle of this bay in depths of 12 to 15 fathoms, mud bottom. In bad weather a better anchorage can be found in the northeast part of the bay in depths of 20 fathoms. The only known village on this island is situated near a small inlet just northward of the bay. Fresh water can be obtained here in barrels or cans.

Poelau Lintang, an island 610 feet high, lies close southeastward of Poelau Airaboe, from which it is separated by a narrow boat channel. An islet lies about 1/4 mile off its western side. Extending about 1 1/3 miles in an easterly and northeasterly direction from the island is a group of six islets. The northeasternmost islet is 180 feet high and is situated about 1 1/3 miles from the island, and the easternmost is 220 feet high and is situated about 3/4 mile southward of the 180-foot islet. The passages between these islets should not be attempted.

Witte Rots, a group of rocks, lies about 3/4 mile southeastward of the southeastern extremity of Poelau Lintang; the southernmost rock is flat-topped and 45 feet high. Foul ground, on which stand other rocks, extends about 3/4 mile northward from the flat-topped rock, and a reef awash lies about 2/3 mile west-southwestward of it.

Poelau Gembili, an island 1,065 feet high and about 2 miles long, lies about 7/8 mile southwestward of the southern entrance point of the bay on (continued on page 177)



the western side of Poelau Airaboe. Its summit, situated near the center of the island, is sharp and prominent. A reef awash lies about 1/4 mile off the middle of its northeastern side.

**Tokong Dahan**, a dangerous rock with a least depth of about 1 fathom, and over which the sea occasionally breaks, lies about 1 3/4 miles west-northwestward of the northwestern extremity of Poelau Airaboe. A 2-fathom patch lies close north-northeastward of this rock.

**Tokong**, an islet 100 feet high, lies about 2 1/8 miles north-northwestward of the northwestern extremity of Poelau Airaboe. This islet is steep-to and is covered with trees.

**Poelau Ritan**, an island 450 feet high, is situated about 5 3/4 miles south-southeastward of Poelau Lintang. It is surrounded by a reef that projects about 1/2 mile eastward from its northern part. An islet, 280 feet high, stands on the edge of the reef, and a conspicuous white rock, 40 feet high, lies on the reef about 1/8 mile off the northwestern extremity of the island. Another islet, 200 feet high, is situated about 7/8 mile northeastward of the 280-foot islet. A reef extends for a distance of about 1/3 mile from its northern and western sides. A flat rock, about 30 feet high, marks the extremity of the reef extending from its western side.

**Brownrigg Rock**, with a least depth of 2 fathoms, lies nearly 1 mile east-northeastward of the 200-foot islet.

**Tide rips** have been frequently observed in the area southward of Poelau Ritan, but a thorough survey of the area disclosed no dangers, and it is believed that the irregular depths are responsible for such tide rips.

**9-34 NORTHEASTERN GROUP.**—Poelau Pahit ( $3^{\circ}24'N., 106^{\circ}09'E.$ ) is an island nearly 1 mile long, lying about 6 1/2 miles northeastward of Poelau Doerai, the northernmost island of the southwestern group. This island can be recognized by its comparatively isolated position and its flat wooded summit, 700 feet high. Sunken rocks lie close off its northern side,

and a reef extends from its southeastern side for a distance of about 1/4 mile.

Tokong Belajar, the northernmost of the Anambas Eilanden, is a conspicuous pillar-shaped rock, 68 feet high, lying about 7 1/2 miles east-northeastward of Poelau Pahit. A steep-to reef extends northward from this rock for a distance of about 1/4 mile, and southward from it for about 1/8 mile.

Poelau Moeboer, one of the three large islands in the northeastern group, is situated slightly more than 3 miles southeastward of Poelau Pahit. It is about 6 1/4 miles in length and varies in breadth from about 3/4 mile to 4 miles. The summit, situated on the southeastern part of the island, is 1,330 feet high and densely wooded. The northwestern coast of this island is foul, and its southeastern side is fringed by a narrow reef. Telok Ajer Bandong is a narrow bay that indents the southern coast of the island to a distance of about 1 3/4 miles. Poelau Mantas, an island 520 feet high and about 1 mile long, lies close eastward of the southwestern extremity of Poelau Moeboer and forms the western entrance point of Telok Ajer Bandong. Good anchorage is available in Telok Ajer Bandong in a position about 3/5 mile northward of the northern extremity of Poelau Mantas, in depths of 17 to 21 fathoms, mud bottom.

Poelau Rinji, an islet 165 feet high, lies about 1 mile northwestward of the western extremity of Poelau Mantas and about 1/4 mile off the southwestern coast of Poelau Moeboer. This islet has black cliffs, about 50 feet high, on its south end.

Pedjantai, a flat-topped islet 215 feet high, lies about 1 mile northward of Tandjoeng Sapan, the western extremity of Poelau Moeboer.

Poelau Noran, an islet 160 feet high, lies close off the northern extremity of Poelau Moeboer.

Poelau Matak, the second largest island of the northeastern group, lies close eastward of Poelau Moeboer. It is about 9 1/2 miles long and 3 1/2 miles wide. Goenoeng Nioelwan, its conspicuous summit, is 1,365 feet high, and is situated near the southern extremity of the island. The entire

coastline of the island is mountainous, but its interior is low and flat. Telok Nioelwan is a narrow shallow inlet, about 3 miles long, that divides the southeastern part of the island into two peninsulas. Many villages are situated on the shores of this inlet, but it is of little navigational importance because of reefs that fringe its sides and render it accessible only for small craft.

Selat Matak is the name given to the channel that separates Poelau Matak and Poelau Moeboer. Its southern end is about 2 1/4 miles wide, and lies between the southern extremity of Poelau Mantas and Tandjoeng Jang, the west extremity of Poelau Matak. The channel narrows to a width of about 1/4 mile at its northern end, where it opens into Telok Matak. It is deep and free of dangers. The tidal current, which is diurnal in character, sets northward and southward through this channel, and attains a velocity of 1 to 2 knots in its narrowest part.

**9-35 Telok Matak** is a large bay situated between the northern parts of Poelau Matak and Poelau Moeboer. Its greatest width is about 2 1/2 miles. There are several islets and rocks in the northwestern part of the bay, all lying within 1 1/2 miles southward and eastward of the northern extremity of Poelau Moeboer. Poelau Oetjing, the easternmost of these islets, is 240 feet high. Vessels entering Telok Matak should pass eastward of this islet. Poelau Tenggiling, 450 feet high, Poelau Doet, 90 feet high, and Langor, 70 feet high, are the other islets in this vicinity. Vessels can anchor anywhere in Telok Matak in depths of 22 to 30 fathoms, mud and coral bottom.

Poelau Semoet, a wooded island 710 feet high and about 1 1/2 miles long, lies close off the northern extremity of Poelau Matak. Selat Onas, the channel between these islands, is less than 200 yards wide at its narrowest point, and is too shallow and rockstrewn to be navigable. Tandjoeng Pandan, the northern extremity of Poelau Semoet, forms the northern entrance point of Telok Matak. A 3-fathom **patch** lies about 1 1/4 miles southeastward of Tandjoeng Pandan.

Poelau Baroe, an islet 250 feet high, lies in the northeastern part of Telok Matak about 1/4 mile off the northwestern extremity of Poelau Matak.

Telok Oeloe Mangar, a narrow inlet on the northwestern coast of Poelau Matak, and a branch of Telok Matak, is formed by a very narrow neck of land projecting northward from Poelau Matak and terminating at a position nearly 1 mile southward of Poelau Baroe. A reef extends about 1/4 mile northward from this neck of land, and a detached reef, about 1/4 mile in extent, lies close northward. The village of Pemoetoes is situated on the western side of the inlet about 1 mile from its entrance.

**9-36 POELAU SIANTAN**, the largest and most important island of the northeastern group, is about 10 1/2 miles long and 5 1/2 miles wide. It is situated southward of Poelau Matak, from which it is separated by a channel 1/3 mile to 2 1/2 miles wide. The island is mountainous throughout and densely wooded. Sama, its summit, attains an elevation of 1,855 feet, and is situated near the middle of the west side of the island. This mountain is a conspicuous landmark, but the general outline of the mountain ridges in the wider parts of the island is smooth and rounded, making identification of the peaks somewhat difficult. The coastline is irregular and is indented by several bays, some of which afford good anchorage. There are no rivers of any importance on the island, but there are numerous mountain streams.

**9-37 Western coast of Poelau Siantan.**— From Tandjoeng Pedas ( $3^{\circ}14'N.$ ,  $106^{\circ}12'E.$ ), the northwest extremity of Poelau Siantan, the coast trends in a general southerly direction for a distance of about 7 miles to Tandjoeng Mandi Angin. Between these points, the coast is fairly steep-to and is free of reefs. Several sunken rocks lie off this section of the coast within the 6-fathom curve, which is nowhere more than 300 yards off shore.

Telok Ramboetan, a narrow bay about 1 mile long, is entered between Tandjoeng Mandi Angin and a point of land nearly 1 mile southeastward.