

swing before those of deeper draft. If rain falls in the interior there are sometimes two tides a day, although this is exceptional, as the city lies too far from the outlet of the Air Moesi. During the rainy season, especially from December to May, there is sometimes no flood current at Palembang for days at a time.

5-52 PILOTAGE.—A pilot vessel, showing a light, is located about 6 miles north-north-east of Tandjoeng Tjarat. Pilotage is compulsory, with few exceptions. Pilots are stationed on the pilot light vessel and board ships by motor launch. Vessels are taken upriver both day and night, however, the hours for berthing and shifting within the harbor limits is 0600 to 2200. There are 24 Indonesian river pilots available; they are competent but generally understand or speak little English.

It was reported (1964) that the buoy to which the pilot vessel is usually moored is small and unlighted and is difficult to distinguish when the pilot vessel is off station.

It was reported (1964) that the pilot vessel was not on station.

An old pilot station is located on the west side of the river entrance, in a position about 2 miles southward of Tandjoeng Tjarat. The wharf at the station is 150 feet long and has a depth of 14 feet alongside.

The skeleton structure of a beacon, from which the light fixture has been removed, is located near the old pilot station.

The Palembang Harbor Master requires Masters of all inbound vessels arriving at the Outer Bar to count the number of vessels anchored outside the bar, awaiting pilot, and then hoist the subsequent number flag, on his own vessel so as to indicate to the pilot boat his vessel's turn to receive a pilot and proceed upriver.

Pilots for passage to Palembang are signaled for as prescribed in the International Code of Signals. Pilots for passage up the Air Banjoeasin and its tributary the Air Lalang to Moera Bahar are signaled for by displaying the answering pennant below the international signal.

To avoid delay in obtaining a pilot for the Air Moesi, the master should radio the Harbor-Master or ship's agent at least 24 hours in advance, stating the vessel's draft and expected time of arrival at Palembang entrance light buoy. A harbor pilot must be ordered at least 6 hours in advance for dock-

ing operation. Palembang radio (PKC) may be used for transmitting messages.

In 1961 a harbor pilot boarded a vessel bound for Kartapati off Palembang.

The pilot signal must be kept displayed until the pilot is aboard or an answering signal has been made. Vessels arriving at night and not wishing to enter until daybreak should display the pilot signal only at daybreak.

ANCHORAGE IS PROHIBITED in an area within a radius of 550 yards of a point about six miles 018° from Tandjung Tjarat.

Vessels awaiting a pilot can anchor in a 2 1/2 mile wide anchorage area just northward of the prohibited area mentioned above. Depths range from about 6 1/2 to 10 fathoms (LWS).

In late 1961 a radiotelephone station was reported to be located at Tandjoeng Gedeh (Bujut). Installation was made to assist vessels navigating the Air Moesi between the entrance and Palembang.

5-53 AIDS TO NAVIGATION.—A pilot light vessel is located about 6 miles north-northward of Tandjoeng Tjarat.

The range for crossing the outer part of the bar consists of two lights shown from iron framework structures, equipped with radar reflectors. The front light structure has a ball topmark on a horizontal cylinder with a black band and is about 2 3/4 miles northward of Tandjoeng Tjarat. The rear light structure is about 3/4 mile 216 1/2° from the front light structure and has a ball topmark on a horizontal cylinder with red bands.

It was reported (1965) that the outer lighted range beacon had been replaced by a lighted can buoy, painted in black and white stripes and surmounted by a cage.

The range for crossing the inner part of the bar consists of two light beacons equipped with radar reflectors. In range astern 005 1/2°, this range leads across the inner bar from a position at the intersection with the entrance range. The rear beacon consists of a white framework tower located about 4 1/2 miles northward of Tandjoeng Tjarat. The front beacon is located about 3/4 mile southward of the rear beacon and has a ball topmark on a horizontal cylinder with a black band. A light buoy, painted black, equipped with a radar reflector, is moored on the east side of the fairway near the intersection, about 700 yards south-southeastward

of the inner bar front range beacon.

Two surveying beacons, each surmounted by two spheres painted in red and white stripes, are located in the approaches to Air Moesi. One is located about 1 1/3 miles northeast of Tandjung Kampeh and the other is located about 3 1/2 miles northeastward of Tandjoeng Tjarat.

Navigation of the river from within the bar to Palembang is facilitated by a number of other buoys and beacons for which local knowledge is essential.

A mid-1962 report states the navigational aids on the Air Moesi are unreliable; most aids are missing or unlighted.

5-54 TIDE GAGES.—There are several tide gages standing in the approaches to and within the entrance of the river; odd numbered gages on the west side of the channel and even numbered on the east side. The gages are divided in decimeters, the lower edge of the number indicating that depth. A correction must be applied to the reading of each gage to obtain the least depth in the relevant part of the channel. The positions of the gages and the corrections to be applied are given below.

A tide gage is located about 250 yards north of Tandjung Tjarat.

No. 1 (for vessels entering) is attached to the outermost range light structure located about 4 1/2 miles northward of Tandjoeng Tjarat. A correction of 4 1/4 dm added to the reading gives the least depth on the outer bar.

No. 3 (for vessels leaving) is attached to the front light structure of the south pair of range beacons located about 2 3/4 miles northward of Tandjoeng Tjarat. A correction of 21 1/4 dm added to the reading gives the depth on the outer bar.

No. 2 (for vessels entering) is located about 1/2 mile southward of Tandjoeng Gedeh. A correction of 13 3/4 dm added to the reading gives the depth in the channel eastward of Pajung.

No. 7 (for vessels leaving) is located about 1/4 mile west-southwestward of the south extremity of Pajung. A correction of 7 1/4 dm added to the reading gives the depth in the channel westward of Pajung.

Tide gage No. 7 was reported missing (1966).

The tide gages, on the east side of the river about 1 mile south of the entrance of the Upang River and at Peradjin on the east side of the river, are divided in feet but in 1957 could not be read by passing vessels.

5-55 REGULATIONS.—From 2 hours to 1 hour before high water, incoming vessels have priority for crossing the outer bar of the Air Moesi; from 2 hours to 3/4 hour before high water, out-going vessels must wait at anchorage berths situated off the west bank of the river between 2 and 3 miles south of Pajung.

Vessels bound upriver must use the channel eastward of Pajung Island, except as noted in section 5-49.

Vessels bound downriver must use the channel westward of Pajung Island.

Information regarding navigation of the Air Moesi and regulations additional to those listed above may be obtained at the harbor office at Palembang. Penalties may be inflicted for violation of regulations.

In 1962 a vessel was delayed 24 hours in clearing the port due to an Indonesian holiday.

Immigration and Quarantine formalities may be handled at Sungai Gerong or Pladjoe, for vessels arriving from foreign ports. Those arriving from Indonesian ports require no formalities of this nature, unless passengers are on board.

5-56 REEDE PALEMBANG.—This roadstead or river port consists of a section of the Air Moesi about 50 miles upriver from the entrance.

5-57 ROADSTEAD LIMITS.—The down-river limit of the roadstead is a line drawn 000° from the east point of the entrance of the Soengai Koendoer; the upriver limit is a line drawn 030° from a position on the right (east) bank of the Air Moesi about 1,600 yards westward of the west point of the entrance of the Air Kramasan.

Landmarks of some prominence exist in the area between the Soengai Kundur entrance and Sungai Gerong; the latter is the name

car ferries, one 1 1/2-ton electric crane, two 10-ton sheerlegs, numerous warehouses, crawlers and mobile cranes of from 3 to 80 tons capacity, and more than 320,000 square feet of covered storage.

Two harbor pilots are available.

Repairs.—Minor repairs to vessels can be executed at Soengai Gerong and Pladjoe.

There is a repair and building yard in Palembang which is capable of handling minor repair work. This yard has 5 slipways, the largest of which has a lift of 400 tons. It was reported (1960) that two drydocks, each capable of accommodating vessels of up to 200 tons, and a floating crane with a capacity of 30 tons are available in Palembang.

Supplies.—Water is available, but should be boiled before drinking. Coal of inferior quality for bunkers, bunker fuel oil, and diesel oil are obtainable.

Communications.—Kartapati is the northern terminus of the South Sumatra Railroad. There are no direct railroad connections into Palembang, Pladjoe, or Soengai Gerong.

Highways extend far inland but are generally in poor condition.

Palembang is in regular communication by steamer with other ports in Indonesia. The city is connected by air with Singapore and Djakarta.

Palembang is connected with the general telegraph and the district telephone systems. Radio stations are operated at Palembang and Soengai Gerong.

Medical.—There are a number of hospitals in the port area, some of which have modern equipment and facilities.

Meteorological table.—See Appendix II.

5-60 AIR BANJOE A SIN (Banyuasin River).—This river flows into Straat Bangka on the south side of Tandjoeng Kampeh, the south extremity of Batakarang Punt. Tandjoeng Apiapi (2° 17' S., 104° 51' E.), the south point of the entrance, is about 4 1/4 miles westward of Tandjoeng Tjarat.

5-61 Entrance.—The entrance and the river itself, although having only a course of about 35 miles, are broad; nevertheless, passage up the river should not be undertaken without local knowledge.

The greater part of the entrance is occupied by shoals, leaving only a narrow channel along the southeast side past Tandjoeng Apiapi. The drying flat off Tandjoeng Kampeh

extends eastward more than 1 mile. Vessels should not proceed within the 6-fathom curve in this vicinity.

A survey beacon stands in shoal water, about 1 1/2 miles northeastward of Tandjoeng Kampeh. (See section 5-53.)

The entrance channel is marked by a number of buoys. The outermost is a white conical buoy with a ball topmark moored in a position about 1 1/2 miles northward of Tandjoeng Apiapi.

5-62 Tributaries.—At Tandjoeng Sereh, about 9 miles southwestward of Tandjoeng Apiapi, the Air Banjoeasin divides into two branches. The northern branch, the Air Chaleh, has an entrance known as Telok Tebing Tinggi. The Air Lalang enters the northern bank of the Air Chaleh in a position about 6 miles westward of Tandjoeng Sereh. The Air Lalang is about 130 miles long, and along its course are numerous wells producing oil that is piped to Palembang.

Vessels with local knowledge and not exceeding 18 feet in draft can be taken up the Air Lalang as far as Moeara Bahar, a settlement about 100 miles from the entrance.

5-63 EASTERN COAST OF SUMATRA.—The coast of Sumatra trends about 67 miles north-northwestward from Batakarang Punt to Tandjoeng Diaboeng. This entire section is low and wooded, and is fronted by a mud bank over which, in places, the depths are 5 fathoms or less as far as 13 miles offshore. Tandjoeng Djaboeng, however, is comparatively steep-to; off this point the 5 fathom curve is barely 1 mile offshore. A number of rivers flow through this coast.

For a description of Straat Berhala, which leads past Tandjoeng Diaboeng, and the coast of Sumatra farther northward see H.O. Pub. 70, "Sailing Directions for Malacca Strait and Sumatra."

5-64 NORTHWESTERN AND NORTHERN COASTS OF BANGKA.—The coast of Bangka trends about 38 1/2 miles northeastward from Tandjoeng Oelar (sec. 5-41) to Tandjoeng Melala, and thence nearly 19 miles eastward to Tandjoeng Samak, the northeastern extremity of Bangka.

Two large bays, Teluk Kampa and Teluk Klabat, indent this section. Teluk Kampa is entered around a point close northeastward of Tandjoeng Oelar; Teluk Klabat is entered eastward of Tandjoeng Melala.

A dangerous wreck lies in the approach to Teluk Kampa, in a position about 13 miles north-by-westward of Tandjoeng Oelar.

5-65 TELUK KAMPA (Bulu Bay).—Tandjoeng Biat, about 2 1/2 miles northeastward of Tandjoeng Oelar, is the southwest point of the entrance of this bay. Tandjoeng Genting, about 17 miles northeastward of Tandjoeng Biat, is the northeast point of the entrance.

ENTRANCE—SHORES.—Karang Sebidoeng Oema and the shoals close northward of it, which lie off the coast between Tandjoeng Oelar and Tandjoeng Biat, have been described in sec. 5-42.

Tandjoeng Genting is a rather steep-to, rocky point. Numerous rocks rise from the coastal bank which extends a short distance from the point. A shoal, with a depth of about 1 fathom over it, lies near the edge of the 6-fathom curve in a position about 3/4 mile north-northwestward of the point.

The foreshore of Teluk Kampa is as wide as 1 mile in places, and has on it a number of rocks. Farther out are numerous rocks, and rocks lie as far as 1 1/2 miles off Tandjoeng Belanak, a point about 5 miles east-northeastward of Tandjoeng Biat. Kamudi, a rock which almost dries at low water, is about 5 miles southeastward of Tandjoeng Genting and about 2 miles offshore. A shoal, with depths of 3 fathoms or less, extends about 2 3/4 miles southward from a position 2 1/2 miles southward of Tandjoeng Genting; this shoal does not discolor. A barrel buoy, painted in black and white bands, is moored about 7/8 mile eastward of the north end of this shoal.

5-66 REEDE DJEBOES.—The entrance of the Soengai Boeloe (Bulu) is about 4 3/4 miles east-southeastward of Tandjoeng Genting; the entrance of the Soengai Kampa is about 1 mile farther southward.

Reede Djeboes is the roadstead off the entrance of the Soengai Kampa, and has as a roadstead limit the arc of a circle drawn with a three mile radius with the northern point of the entrance to the Soengai Kampa as a center.

ANCHORAGE can be taken in a depth of 5 fathoms in a position from which Tandjoeng Genting bears 018° and is about 1 1/2 miles distant, and from which the entrance of the Soengai Boeloe bears 098°. Care must be taken to avoid the depths of 19 feet eastward of this position. Small vessels can anchor closer in.

Boats land at the ferry at the village of Kampa, which is about 1 1/2 miles upriver on the northern bank of the Soengai Kampa. Communication by boat with the shore is usually dangerous during the northwest monsoon.

5-67 VILLAGES.—Djebus (Djeboes) (1°45' S., 105°27' E.), the center of a tin-mining district, is on the Soengai Djebus, a tributary of the Soengai Kampa. Small vessels with a draft of 8 feet can proceed up the Soengai Kampa a distance of about 8 miles to the entrance to the Soengai Djebus.

The district is in regular communication by steamer with other ports of Indonesia.

Lighters are available at the landing place. Limited quantities of fresh water are obtainable.

5-68 NORTHWESTERN AND NORTHERN COASTS OF BANGKA (continued).—The northwest coast of Bangka trends about 20 miles northeastward from Tandjoeng Genting to Tandjoeng Melala. This section has a fringe of reef, as wide as 1 mile in places, from which rise numerous rocks above water.

This coast has a number of salient points, between which are shallow bays of no importance to navigation. Tandjoeng Penjaboeng (Penjabung) is a rather steep-to point about 3 1/2 miles north-northeastward of Tandjoeng Genting, and about 3 3/4 miles farther northeastward is Tandjoeng Pemoedja (Pemudja). Tandjoeng Dojang (Doyang) (Kelajang) is nearly 5 miles northeastward of Tandjoeng Pemoedja, and about 6 1/4 miles farther east-northeastward, and 2 miles westward of Tandjoeng Melala, is Tandjoeng Seangoes (Seangu) (Sangau).

5-69 LANDMARKS.—Useful marks along this coast are three conspicuous hills resembling islands when seen from a distance.

Paree (Mempari), a hill 668 feet high, the southernmost of three hills, lies about 3 3/4 miles eastward of Tandjoeng Genting.

Goenoeng Penjaboeng (Penjabung), a hill 732 feet high, is about 2 3/4 miles northwestward of Paree and just within Tandjoeng Penjaboeng.

Goenoeng Besoekan (Besukan) is nearly 4 miles north-northeastward of Paree, and

about 2 1/4 miles southeastward of Tandjoeng Pemoedja.

Gantang (Ganten), a hill about 6 1/2 miles east-northeastward of Paree, is noticeable from a short distance only.

5-70 OFF-LYING ISLETS AND DANGERS.—Pulan Pemoedja (Pemudja) (1°35' S., 105°23' E.) is a small islet off Tandjoeng Pemoedja. It is a (continued on page 97)

useful mark for avoiding the reefs between that point and Tandjoeng Dojang (Doyang). A rock awash lies about $2\frac{1}{4}$ miles northeastward of Pemoedja and about $1\frac{1}{2}$ miles offshore.

Proet (Prut) is a small islet about 1/2 mile westward of Tandjoeng Dojang. Rocks, some above and some below water, lie nearly 3/4 mile westward of Proet.

Malang Hijoe (Haiu) (Iju) is a formation of two rocks awash lying close to each other in a position about $2\frac{1}{4}$ miles northward of Tandjoeng Dojang. Two rocks awash lie between Malang Hijoe and Tandjoeng Dojang.

Malang Dojang (Doyang) is a grayish-yellow rock, very conspicuous, lying about 4 miles east-northeastward of Malang Hijoe, and about $3\frac{1}{4}$ miles northwestward of Tandjoeng Seangoes. The rock resembles a vessel floating bottom up. A coral reef, over which the depth is 3 feet, lies about 1 mile southward of Malang Dojang, and nearly 1 mile farther southward is a patch of $3\frac{1}{4}$ fathoms.

Malang Goentoer (Guntur), a cluster of rocky heads of which one is above water and the others dry, lies about 1 mile northward of Tandjoeng Seangoes and about $1\frac{1}{2}$ miles northward of the same point is a shoal over which the depth is $4\frac{1}{4}$ fathoms. A rock awash lies nearly $1\frac{1}{2}$ miles westward of Tandjoeng Seangoes.

5-71 TELUK KLABAT.—This large bay indents the northern coast of Bangka a distance of about 17 miles in a general south-southeastly direction. The western point of the entrance is Tandjoeng Melala, and the eastern point is Tandjoeng Penjoesoe which is about 6 miles eastward of Tandjoeng Melala.

The bay is divided into an outer and inner portion by a spit, terminating in Tandjung Ruh, extending from its western shore. Tandjung Ruh is nearly 10 miles southeastward of Tandjung Melala.

The greater part of the outer bay is occupied by a flat, over which the depths are 3 fathoms or less, and on which are numerous rocks, some above water. There is a long ground swell in Klabat Bay which causes considerable rolling of both vessel and lighter.

The inner bay has an area approximately equal

in size to the outer bay. The head of the inner bay is bordered by a mud bank, on which are a number of trees that stand in the water at high tide.

The shores of the bay consist of sandy beaches on which are a number of large blocks of granite. The western shore of the bay has a border of reef as wide as 3/4 mile in places.

A number of rivers flow through the shores of Teluk Klabat. Into the southeastern part of the inner bay flows the Soengai Lajang (Layang), one of the largest rivers of Bangka.

5-72 Landmarks.—Gunung Klabat, a hill 463 feet high, stands near the western shore of the bay in a position about 5 miles southward of Tandjoeng Melala.

Maras Gebergte (Maras Mountains), the highest range of Bangka, rises in the midst of a waste and impenetrable district. The range has three peaks that give it a crownlike appearance. The formation is very conspicuous. The range is about 5 miles south-southeastward of the head of Teluk Klabat.

5-73 Entrance.—Tandjoeng Melala, the western point of the entrance of Teluk Klabat, is a rocky point. A useful mark for the point is Melala Huevel, a hill 453 feet high, on the western side of the point. A reef, over which the depth is $2\frac{1}{2}$ fathoms, lies nearly $2\frac{3}{4}$ miles northward of the point, and is not usually discolored. A $5\frac{1}{2}$ -fathom patch lies about $\frac{1}{2}$ mile north-northeastward of the reef. Rocks, with depths of less than 1 fathom over them, lie about 1 mile north-northwestward, northeastward, and eastward, respectively, of Tandjoeng Melala; because of these off-lying dangers not marked by discolored, the point should not be approached closer than $1\frac{1}{2}$ miles.

Tandjoeng Penjoesoe (Penjusu), the eastern point of the entrance to Teluk Klabat, is a low point from which a spit, with depths over it of 3 fathoms or less, extends nearly 2 miles in a west-northwesterly direction. Poelau Penjoesu (Penjusu) is a low islet lying nearly $\frac{3}{4}$ mile westward of the point.

Poelau Penjoesoe Light ($1^{\circ}32' S.$, $105^{\circ}41' E.$) is shown from a white iron framework structure, 66 feet high, on the southern side of the islet. Numerous rocks, some above water, lie between Poelau Penjoesoe and Tandjoeng Penjoesoe.

A depth of 1 fathom has been reported to exist about 1 1/2 miles westward of Penjoesoe Light (1951).

5-74 Entrance channel.—A narrow channel trends along the eastern side of Teluk Klabat; vessels of moderate draft and with local knowledge can proceed through this channel to Reede Belinjoe (Blinyu), a roadstead near the entrance to the inner bay. The least depth in the fairway through this channel, near its northern entrance, is 3 1/4 fathoms. The bottom of the channel is formed of granite in places, which is, of course, undesirable holding ground. The western side of the channel is formed by a steep-to ridge of hard sand that dries in places. **Buoys** mark the channel. It was reported (1955) that the depths over the bar at the entrance of Teluk Klabat, between the two outer buoys, were 2 feet less than charted.

5-75 Islets—Dangers.—In the approach to Teluk Klabat from north eastward is Karang Trasi Laoet (Laut), a steep-to rock lying about 2 1/2 miles north-northwestward of Poelau Penjoesoe. The depth over the rock is 1 1/2 feet. The rock lies along a line established by the western part of Maras Gebergte in range, bearing 156°, with Poelau Penjoesoe Light. This rock is not marked by discoloration.

Karang Trasi Darat is a rocky patch lying nearly 800 yards eastward of Karang Trasi Laoet. The least depth over the patch is 5 feet. This patch is not marked by discoloration.

Malang Tadjau is a drying rock about 1/2 mile westward of Poelau Penjoesoe. Anak Tadjau, close northeastward of Malang Tadjau, has over it a depth of 6 feet.

A rocky shoal, over which the least depth is 1 1/4 fathoms, lies more than 1 mile westward of Poelau Penjoesoe. The western side of the shoal is steep-to; off its southern side is a red can buoy with a red cylinder topmark. The entrance of the channel is entered by passing around the southwestern side of this shoal.

The islets and dangers just described, as well as those discussed in connection with Tandjoeng Mantong, are in or near the entrance to Teluk Klabat. The chart is the most concise guide to the numerous rocks, shoals, and islets in the bay itself.

5-76 Tidal currents.—The tidal currents in

Teluk Klabat turn at about the same times as high and low water. The currents in general follow the direction of the entrance channel, but at Tandjoeng Mantong, the point marking the eastern side of the entrance to the inner bay, the flood current sets toward the eastern shore, and the ebb current toward the western shore. Both currents are strong at spring tides, especially in the narrow passage between Tandjung Ruh and Tandjoeng Mantong, where a maximum rate of 3 knots has been observed.

Anchorage.—In early 1961, a vessel anchored in 6 fathoms, about 2 1/8 miles east-northeastward of Tandjoeng Melala.

Pilotage.—In early 1961, no pilot was available for Teluk Klabat and Reede Belinjoe.

5-77 Directions.—Enter the deep channel along the eastern shore of Teluk Klabat by steering a course of 90° so as to pass about 200 yards southward of the can buoy marking the shoal about 1 mile westward of Poelau Penjoesoe. Thence round a black and white checkered conical buoy moored about 1,660 yards 215° from Poelau Penjoesoe Light, and thence steer a general south-southeasterly course through the channel between the buoys on either side.

5-78 REEDE BELINJOE (BLINYU).—The western point of the entrance to the inner portion of Teluk Klabat is Tandjung Ruh; the eastern point is Tandjoeng Mantong, which is nearly 1 mile northeastward of Tandjung Ruh.

Reede Belinjoe is the roadstead lying near the entrance to the inner bay. The western limit of the roadstead is a line connecting Tandjung Ruh with Kelapa Besar, an islet lying about 1 mile northwestward of the point; the northern limit is a line drawn from Kelapa Besar to the small islets lying off Tandjoeng Mantong; the southern limit is the line connecting Kambing with the entrance to the Soengai Belinjoe. Kambing is an islet close off the western shore of the inner bay in a position about 2 1/2 miles southwestward of Tandjung Ruh. The entrance to the Soengai Belinjoe (Blinyu), a river flowing through the eastern shore of the inner bay, is nearly 2 miles southeastward of Tandjoeng Mantong.

A navigable channel, with a least depth of 2 1/4 fathoms, is reported to trend generally south-

southeastward through the inner bay from Reede Belinjoe to the entrance of the Soengai Lajang. The entrance of this river has across it a bar over which the least depth is 6 feet.

5-79 Dangers.—The principal dangers in Reede Belinjoe appear from the chart to be in the eastern portion, near Tandjoeng Mantong.

Batoe Merlang, a rock above water, lies nearly $\frac{1}{2}$ mile southward of Tandjoeng Mantong. A red beacon stands on Batoe Merlang. A white triangular beacon stands on most of the points on the eastern side of the bay.

A drying rock lies about 500 yards northwestward of Batoe Merlang. Numerous other rocks, as well as a number of tiny islets, lie on the eastern side of the entrance of the inner bay.

5-80 Anchorages.—Sheltered anchorage, with sufficient space to swing, can be taken up southward of Tandjoeng Roeh, in 3 to 6 fathoms.

Vessels wishing to unload by praus as near as possible to the town of Belinjoe can anchor in a position from which Batoe Merlang bears 000° and Tandjoeng Roeh bears 300° . The depth in this position is 8 fathoms; the bottom is mud and sand.

Boats can land at a wooden pier on the northern bank of the Soengai Belinjoe about $1\frac{1}{2}$ miles upriver from the entrance. The channel is marked by beacons, privately maintained.

Prohibited anchorage.—Two submarine telegraph cables cross the entrance to the inner bay between Tandjoeng Roeh and Tandjoeng Mantong. Anchorage is prohibited because of these cables in an area bounded on the north by a line drawn in a 031° direction from Tandjoeng Roeh to the northern extremity of Tandjoeng Mantong, and bounded on the south by a line drawn in a 050° direction from Tandjoeng Roeh to the head of the pier southward of Tandjoeng Mantong.

5-81 TOWNS.—Mantong ($1^{\circ}38'S.$, $105^{\circ}44'E.$) stands close within Tandjoeng Mantong. Boiler water is available; it is supplied in drums brought alongside in praus.

An islet about 400 yards southward of Tandjoeng Mantong is connected to the shore by a jetty, and from the southern side of the jetty extends a pier which has a steam crane on its outer end.

A railroad connects Mantong with Belinjoe.

A late 1960 report states the following: "On the south side of Tandjoeng Mantong are two wharves, each wharf equipped with 2-ton cranes. The larger wharf (eastern) has a depth of at least 12 feet at datum and can accommodate vessels of 200-foot length and 6-foot draft. The crane on this wharf has a grab for discharging coal. Small oil tanks stand near the wharf, and close eastward are three 100-ton marine railways.

The town of Mantong has local customs, but immigration and military control are apparently exercised from Pangkalpinang, 50 miles distant."

Belinjoe (Blinyu) ($1^{\circ}38'S.$, $105^{\circ}47'E.$), on the Soengai Belinjoe, is the center of a mining district. A small government hospital is maintained in the town. The town is connected to the general telegraph system.

Bakit ($1^{\circ}40'S.$, $105^{\circ}42'E.$), is a village on the western shore of the inner bay in a position about $1\frac{1}{4}$ miles southwestward of Tandjoeng Roeh. A wooden pier, with a depth of 3 feet at its outer end, extends from the shore abreast the village.

Steamers connect places in Reede Belinjoe with other ports of Indonesia.

5-82 NORTHERN COAST OF BANGKA.—The north coast of Bangka trends about 11 miles eastward from Tandjoeng Penjoesoe to Tandjoeng Mengkoedoe (Mengkudu). Tandjoeng Penjoesoe has been described with Teluk Klabat. Tandjoeng Mengkoedoe is a rocky point.

This section has a sandy beach. Two villages along this section are visible from seaward. One is Boeboes, near the outlet of the Soengai Boeboes (Bubus) about $4\frac{1}{2}$ miles eastward of Tandjoeng Penjoesoe; the other is Salin, lying about $1\frac{1}{2}$ mile eastward of the outlet of the Soengai Sembroeang (Sembuang). The latter outlet is nearly 3 miles west-southwestward of Tandjoeng Mengkoedoe.

Tandjoeng Samak (Grasak), about 2 miles eastward of Tandjoeng Mengkoedoe, is a rocky point forming the northeastern extremity of Bangka.

The eastern coast of Bangka is described in chapter 6.

5-83 Islets—Dangers.—Several rocks lie off the western part of the coast between Tandjoeng Penjoesoe and Tandjoeng Mengkoedoe, and it should not be approached within depths less than 6 fathoms.

Poelau Mengkoedoe (Mengkudu) consists of two islets lying nearly $1\frac{1}{2}$ miles northward of Tandjoeng Mengkoedoe. Discolored water was reported in a position about 14 miles northwestward of the same point.

A dangerous shoal, over which the depth is 3 fathoms, lies about $4\frac{1}{4}$ miles west-northwestward of Tandjoeng Mengkoedoe and nearly $2\frac{1}{2}$ miles offshore.

5-84 ISLETS AND DANGERS NORTHWARD OF BANGKA.—The Toedjoeh Eilandien lie northward of Bangka in the approach to Straat Bangka from the northeastward. The islets in the group are all reef-fringed, and

they are generally visible from distances up to 25 miles. They are occasionally visited by coasters and native praus.

Poelau Dokan and Totij are detached islets.

5-85 Toedjoeh Eiland.—Poelau Joe (Penjaman) ($1^{\circ}17' S.$, $105^{\circ}16' E.$), the southernmost of the group, is about 26 miles northward of Tandjoeng Genting on Bangka. This small islet is 312 feet high. An area of discolored water lies about $1\frac{2}{3}$ miles southeastward of Poelau Joe.

Pasir Keliling, an islet covered with coconut trees, is about $\frac{3}{4}$ mile north-northwestward of Poelau Joe. There is a native settlement on the islet. A shoal, over which the depth is $3\frac{1}{4}$ fathoms, lies about 1 mile east-northeastward of the eastern extremity of Pasir Keliling.

Poelau Meranti (Lalang), an islet 131 feet high, is about $1\frac{1}{4}$ miles north-northwestward of Pasir Keliling. A 2-fathom shoal lies about $\frac{1}{2}$ mile southwestward of Poelau Meranti.

Poelau (Ju) Satoe, lying nearly $1\frac{1}{4}$ miles northwestward of Poelau Meranti, attains a height of 119 feet. A $2\frac{1}{2}$ -fathom shoal lies about $\frac{1}{2}$ mile southeastward of Poelau Satoe.

Poelau Tjebia (Chebia) is about 3 miles northward of Poelau Joe and about 2 miles eastward of Poelau Satoe. The northwestern and slightly the higher of two peaks on Poelau Tjebia is 358 feet high. The reef fringe extends as far as 1 mile eastward from the southeast extremity of Poelau Tjebia and a depth of 26 feet exists about 200 yards further eastward. A rock, over which the depth is 4 feet, lies about $\frac{1}{2}$ mile eastward of the northern extremity of the islet, and a $2\frac{1}{2}$ -fathom patch lies about $\frac{1}{2}$ mile off the northwestern extremity. There is a native settlement on Poelau Tjebia.

Poelau Katjangang (Pekatjang) (Kachangang), the largest and easternmost of the Toedjoeh Eiland, is about $2\frac{1}{4}$ miles long in a northwest and southeast direction, and is about $\frac{1}{2}$ mile wide. It lies with its southernmost point about 3 miles northeastward of Poelau Tjebia. The highest of several peaks on the island is 558 feet high. Off the southeastern extremity of Poelau Katjan-

gang the reef border is $\frac{1}{2}$ mile wide, and on the reef are several rocks above water. A rock, with a depth of less than 6 feet over it, lies about 400 yards southward and a $3\frac{1}{4}$ -fathom patch lies about $1\frac{1}{2}$ miles south-southeastward of the northwestern extremity of Poelau Katjangang.

A wreck, not dangerous to navigation, is located about 16 miles eastward of Poelau Katjangang.

Tokong Kembang, a small islet attaining a height of 180 feet, is nearly $2\frac{1}{2}$ miles northwestward of the northwestern extremity of Poelau Katjangang. A rock, 36 feet high, lies about $\frac{1}{2}$ mile west-northwestward of Tokong Kembang and a $1\frac{1}{2}$ -fathom patch lies between the rock and Tokong Kembang.

5-86 Observations of the tidal currents have been made in a position about 13 miles south-southwestward of the Toedjoeh Eiland. In this position the currents were seen to set northeastward and southwestward and were mainly diurnal.

The maximum rate of the two tidal currents cannot coincide at spring tides, either for the current setting northeastward or for the current setting southwestward. The maximum rate for the current running northeastward can be expected to average about 1 knot in June and July, and also in December and January (with diurnal spring tides); the maximum rate of the current setting southwestward can be expected to average $1\frac{1}{4}$ knots from November to January, and from May to July (with diurnal spring tides). In addition to the currents setting northeastward and southwestward a current setting across these directions, with a maximum rate of $1\frac{1}{4}$ knots, was also observed.

5-87 Poelau Dokan ($0^{\circ}58' S.$, $105^{\circ}38' E.$), an islet about 26 miles east-northeastward of Tokong Kembang, attains a height of 390 feet. It is visible from 32 to 36 miles in clear weather. A hill on the islet appears pointed when seen from the northward, but rounded when seen from the eastward. Reef fringing Poelau Dokan attains a width of 1 mile off the northern shore of the islet; rocks, some of them above water, rise from this reef. Two islets, the northern 102 feet high, also rise from this reef.

Three reefs lie southward of Poelau Dokan. Mary Rock, the southernmost, lies about $1\frac{1}{2}$

miles southward of the islet, and has over it a depth of 4 feet. The middle reef has a depth of 2 fathoms over it, and the northern reef, the one closest to Poelau Dokan, has over it a depth of 5 feet.

5-88 **Totij (Toty) (Totai)**, an islet about $7\frac{1}{2}$ miles east-northeastward of Poelau Dokan, is 371 feet high. The summit of Totij appears rounded when seen from northward, and pointed when seen from eastward, or the reverse of the appearance of Poelau Dokan. The reef fringing Totij attains a width of $\frac{1}{2}$ mile off the northwestern shore of the islet, and a width of $\frac{1}{4}$ mile off the southeastern shore of the islet.

The channel between Poelau Dokan and Totij is apparently clear; however, inasmuch as reefs in this area are ordinarily not marked by discoloration, it is considered inadvisable to proceed through this channel.

Directions.—When passing between Bangka Island and the Toedjoeh Eilanden, the latter should not be approached to a less depth than 13 fathoms, nor Bangka Island nearer than 5 miles, for some dangers lie about 3 miles in the offing. Near the Malang Hijoe and Malang Dojang (sec. 5-70), the bottom is rocky and the depths irregular.

Vessels keeping southward of Totij and Poelau Dokan in order to cross over to Borneo, must take care to avoid Mary Rock.

CHAPTER 6

GASPAR STRATEN AND APPROACHES

6-1 PLAN OF CHAPTER.—The entire area covered in this chapter is shown on H.O. Chart 3112. The following list of the various subdivisions of the chapter shows in what order the descriptions are presented:

	Section
Gaspar Straten—general remarks—	
currents—pilots	6-2
Islands and dangers in southern approach to Gaspar Straten.....	6-5
Southeastern coast of Bangka.....	6-8
Macclesfield Straat.....	6-9
Southern part.....	6-10
Narrows	6-11
Northern part.....	6-12
Directions.....	6-13
Clement Straat.....	6-14
Directions.....	6-16
Stolze Straat.....	6-17
Southern part.....	6-18
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Anchorages	6-25
Directions from southward.....	6-26
Directions from northward.....	6-27
Western coast of Billiton.....	6-28
Straat Mendarau.....	6-30
Reede Tandjoeng Pandan	6-34
Islands and dangers northward of Gaspar Straten.....	6-42
Northeastern coast of Bangka	6-44
Reede Koba	6-49
Reede Pangkalpinang.....	6-55
Inshore passage from Reede Kobato	
Reede Pangkalpinang.....	6-61
Channel from Gaspar Straten to	
Reede Pangkalpinang.....	6-63
Channel from Reede Pangkalpinang	
to Reede Soengai Liat.....	6-64
Reede Soengai Liat	6-65

6-2 THE GASPAR STRATEN (SELAT GASPAR), one of the principal straits between the South China Sea and the Java Sea, is oriented in a north-south direction between Bangka and Billiton islands. There are numerous islands and reefs in the strait. The

three principal passages through the strait are Macclesfield Straat, Clement Straat, and Stolze Straat.

The Gaspar Straten are considered neither as safe nor as well lighted as Straat Bangka, but are, nevertheless, preferred by many navigators as being shorter and more direct than the latter strait on routes between Soenda Strait and Singapore, and between the western part of Java and the China Sea.

It should not be assumed that all the dangers in the Gaspar Straten have been discovered and charted. This applies also to the approaches. The dangers consisting of reefs that do not uncover are usually marked by tide rips or discoloration. However, discoloration is often caused by large brown patches of weeds or fish spawn as well as by reefs. Reefs that dry are usually recognizable when covered, except in light winds and calms, by the brown or green color of the water over them.

Macclesfield Straat is the westernmost of the Gaspar Straten, Clement Straat is the middle channel, and Stolze Straat is the easternmost. Vessels of ordinary power generally proceed through Stolze Straat because it is the widest and has no known dangers in the fairway. Low-powered vessels are advised to use Macclesfield Straat during the northwesterly monsoon and Stolze Straat during the southeasterly monsoon, as the currents are then less unfavorable. Clement Straat is seldom used.

The following is a statement of the general directions for navigating the Gaspar Straten: do not attempt passage except under conditions of good visibility; use Stolze Straat both when northbound and when southbound as the reefs are easily seen and the islands more easily identified.

6-3 Currents.—The horizontal movement of the water in Gaspar Straten is considerably affected by the monsoons. So far as is known, there is no consistent connection between the horizontal and vertical movements of the water.

The tidal currents are strong in Macclesfield Straat and in Clement Straat, but their directions are somewhat difficult to foretell. The same is true of Stolze Straat, except that it has been learned that near Poelau Langkoeas ($2^{\circ}32' S.$, $107^{\circ}37' E.$), an islet off the northwestern coast of Billiton, the directions of the tidal currents go through a complete circle, clockwise, in one lunar day. The maximum rate always occurs twice each day when the current is running in a north-northeasterly direction and again when running in a south-southwesterly direction. The rates attained by the east-southeast-going current and the west-northwest-going current are about half the maximum rates.

An east-northeasterly current with a rate of $1\frac{1}{2}$ knots was reported between Gaspar Straten and Soenda Strait and a current setting 330° at a rate of $2\frac{1}{2}$ knots was reported between Gaspar Straten and Singapore Straits (in September 1956). A vessel reported (early 1961) an estimated $\frac{1}{2}$ -knot current setting south when she was just north of Stolze Straat.

6-4 Pilots.—Qualified native pilots can be obtained at Tandjoeng Pandan, the capital of Billiton, to take vessels through even the narrowest passages between the islands and reefs in the Gaspar Straten. Those without local knowledge are advised to employ the services of a pilot when visiting any of the islands in the strait.

6-5 ISLANDS AND DANGERS IN SOUTHERN APPROACH TO GASPAR STRATEN.—A passage through Gaspar Straten with a least depth of $9\frac{1}{2}$ fathoms in the fairway, is charted. However, numerous dangers with less than 10 fathoms over them lie in the south approaches to Gaspar Straten. (See cautionary remarks in sec. 6-2.)

Hippogritte reef lies about $36\frac{1}{2}$ miles southeastward of Pulau Dapur (sec. 5-13), and about 23 miles southwestward of Shoalwater Island.

It is worthy of note that from this reef Shoalwater Island light is outside the geographic range of visibility listed in the light list. From the reef the island is beyond the daylight range of visibility. Soundings give little indication of nearness to these steep-to reefs. They consist of three coral patches with

depths of 1 foot to 11 feet over them. At times they are marked by tide rips; birds are frequently seen hovering over them. A $6\frac{1}{2}$ -fathom patch lies about $2\frac{1}{2}$ miles southeastward of the reefs. Less water is reported (1959) in the vicinity of the 13-fathom sounding about $10\frac{1}{2}$ miles southward of Hippogritte.

Hancock, a small coral patch with a depth of $3\frac{1}{2}$ fathoms over it, lies about $16\frac{1}{2}$ miles south-southwestward of Shoalwater Island. This patch, as with Schildpad and Larabe, is not marked by discoloration.

Schildpad, a small coral formation on which is a rock awash, lies about 2 miles northeastward of Hancock, and is about the same size. It is usually marked by tide rips.

Larabe ($3^{\circ}32' S.$, $107^{\circ}10' E.$), a shoal about $5\frac{1}{2}$ miles east-northeastward of Hancock, consists of a small coral reef over which the depth is $2\frac{1}{2}$ fathoms. The above three dangers are surrounded by depths of $6\frac{1}{2}$ fathoms and more, and are not marked by discoloration.

Sand Reef (Zand Rif), a small drying sandbank, which is visible at a distance of 3 miles, lies about 10 miles south-southwestward of Shoalwater Island. The westernmost of a number of small reefs in the vicinity of Sand Reef is Haaien Reef, which lies about $3\frac{1}{2}$ miles westward of Sand Reef and has a depth of $2\frac{1}{2}$ fathoms over it. Middle Reef, about 2 miles north-northeastward of Sand Reef, covers at high water. Branding Reef, the northernmost of the cluster, is about 3 miles northward of Sand Reef, and consists of two small reefs awash.

6-6 Fairlie ($3^{\circ}27' S.$, $107^{\circ}00' E.$) is a rock about $14\frac{1}{2}$ miles southwestward of Shoalwater Island, and has over it a depth of 3 feet. A $5\frac{1}{4}$ -fathom patch lies about $1\frac{1}{2}$ miles northwestward of the rock. The water over the rock is discolored at times. Shoalwater Island is visible from positions near the rock, as are the peaks of the hills (sec. 6-11) on the south side of Poelau Lepar.

Blas Mateu, a coral formation rarely marked by discoloration, lies about 17 miles west-southwestward of Shoalwater Island. The least depth over the formation is $1\frac{1}{2}$ fathoms. Shoalwater

Island is just visible from aloft from positions near Blas Mateu. The hills on the southern side of Poelau Lepar and the hills near Tandjoeng Baginda are also visible from such positions.

The Shoalwater Island consist of two islets and a group of surrounding reefs and shoals. Shoalwater (Simedang) Island, the larger islet, has a maximum length of about 800 yards, and is overgrown with trees visible from distances up to 15 miles. The islet has a reef border about 800 yards wide, and detached patches are found as far as 1 mile from the east side of the islet. Shoalwater Island Light ($3^{\circ}19' S.$, $107^{\circ}13' E.$) is shown from a white iron tower, 187 feet high, with a stone dwelling attached. A beacon stands about $\frac{1}{2}$ mile eastward of the light structure. A pier extends from the southeastern side of the island. Little Shoalwater Islet, the smaller islet, is about $\frac{1}{4}$ mile north-northeastward of the larger islet. Embleton Rif (Embelton Rocks), 2 miles northwestward of the larger islet, consists of two patches on the southern of which is a drying rock visible about 3 miles at low water. Bliss Rif, a cluster of shoal patches about 2 miles northward of the larger islet, has over it a least depth of 2 feet. Detached patches of $1\frac{1}{4}$ and $3\frac{3}{4}$ fathoms lie about 1 mile and 2 miles northward, respectively, of Shoalwater Island; similar patches of 1 fathom and $1\frac{1}{4}$ fathoms lie about $\frac{1}{4}$ mile and $1\frac{1}{4}$ miles westward, respectively, of the same islet. Shoalwater Island should not be approached closer than 3 miles on the west and north sides, nor closer than $1\frac{1}{3}$ miles on the east side.

6-7 Wreck.—A dangerous wreck lies sunk in the south approach to Gaspar Straten, in a position about $12\frac{1}{2}$ miles south-southeastward of Shoalwater Island.

A dangerous wreck lies sunk about $2\frac{1}{2}$ miles south-southeast of Shoalwater Island.

6-8 SOUTHEASTERN COAST OF BANGKA.—The southeast coast of Bangka, between Tandjoeng Pandan (sec. 5-13) and Tandjoeng Baginda, 14 miles to the eastward, consists mainly of low, tree-covered land from which extend numerous rocky points. Tandjoeng Baginda is a steep point, 392 feet high; Baginda

is a 550-foot hill about 1 mile northwestward of the point.

This section has off it a mudbank from which rise rocks both above water and below water. Malang Belajar, two conspicuous rocks above water, lie close together about $7\frac{1}{4}$ miles eastward of Tandjoeng Pandan and about $1\frac{1}{2}$ miles offshore. In order to remain in depths of 5 fathoms or more this section should not be approached closer than 5 miles.

The eastern shore of Bangka trends nearly 5 miles northward from Tandjoeng Baginda to Tandjoeng Roe (Ru). Between Tandjoeng Roe and Tandjoeng Berikat, 27 miles to the north-northeastward, the coast forms a bight, with general depths of 3 fathoms, frequented principally by small coasters and native craft. The shore of the bight is low and consists of beaches and land overgrown with mangroves. The coastal bank, as defined by the 3-fathom curve, extends eastward from the east shore of the bight for as far as 7 miles and also southward from Tandjoeng Berikat for nearly 11 miles. A detached shoal, about $3\frac{3}{4}$ miles in extent and having a least depth of 2 fathoms, lies with its south end about $1\frac{1}{2}$ miles northward of Kelapan Island. Poelau Lepar, an island off the southern side of the bight, has a maximum dimension of about 12 miles. It is separated from the southeastern part of Bangka by Straat Lepar, a strait navigable only by boats. Poelau Tinggi, the southeasternmost of a number of islets in the northern entrance to the strait, has on it a conical hill, 607 feet high, very conspicuous from the southeastward, or from Macclesfield Straat. A number of hilly islands lie off the northern shore of Poelau Lepar. Tandjoeng Berikat, the northern entrance point of the bight, is also the eastern extremity of Bangka. The point is made conspicuous by Berikat, a hill with a remarkable tree on its southeastern slope. The eastern and higher of two summits of the hill is 393 feet high. Some rocks above water lie close off the point. **Tandjoeng Berikat Light** ($2^{\circ}34' S.$, $106^{\circ}51' E.$) is shown on the point.

6-9 MACCLESFIELD STRAAT (STRAIT)

—The western side of the strait is formed by Poelau Lepar and the several shoals lying southward of that island, and the eastern

coast of Bangka. The eastern side is formed by Poelau Liat, and a number of islets and shoals southward of that island.

Macclesfield Straat has many conspicuous marks that are available for determining a vessel's position, except in the southern approach where some of the dangers lie out of sight of land. The narrowest part of the channel, between Poelau Lepar and Poelau Liat, is about 3 miles wide between the shoals on either side.

6-10 Southern part of Macclesfield Straat.—Hippogritte, Fairlie, and Blas Mateu, on the eastern side of the southern approach to Macclesfield Straat, have been previously described (see sec. 6-5).

Drievadem (Three Fathom) Bank, over which the least depth is 2 1/4 fathoms, lies on the western side of the strait in a position about 6 1/2 miles southward of Tandjoeng Meroen (Moeroeng) (Murung), the southeastern extremity of Poelau Lepar. A 4 1/4-fathom patch lies about 5 1/2 miles southward of Drievadem Bank and about 3 miles westward of this patch is a 3-fathom patch. A 4 1/4-fathom patch lies about 8 miles southwestward of the 3-fathom patch. Depths of 6 1/2 fathoms are to be found about 1 1/2 miles northwestward, nearly 5 miles southwestward, and 1 1/4 miles southward of the 4 1/4-fathom patch. Drievadem Bank is especially dangerous at night. A shoal, about 6 miles in extent with a least depth of 4 1/4 fathoms, lies about 1 mile inside Drievadem Bank and parallel with it. A bank, with a least depth of 4 1/4 fathoms, lies with its shoalest part about 3 3/4 miles west-southwestward of the shoalest part of Drievadem Bank.

George Banken extends about 9 miles southwestward from a position about 2 miles southwestward of Tandjoeng Meroen. The least depth over George Banken, in the northeastern part, is 1 1/4 fathoms. Irregular depths of 4 1/4 to 17 fathoms are found between George Banken and Drievadem Bank.

Sittart Reefs (Sittart Riffen) lie on the east side of Macclesfield Straat in a position about midway between the Shoalwater Islands and Poelau Liat. These reefs cover an area about 6 1/2 miles long in a north and south direction. Some of the reefs dry and some are awash. The westernmost reef, over

which the depth is 8 feet, lies about 11 1/2 miles southeastward of Tandjoeng Meroen. It is the outermost danger on the east side of the south part of Macclesfield Straat.

Poelau Bakau, the southernmost of a group of islets on the eastern side of Macclesfield Straat, lies about 8 1/4 miles south-southeastward of the southern extremity of Poelau Liat. The islet attains a height of 123 feet and is covered with trees. It is surrounded by a coral reef, steep-to on the western side; detached reefs extend as far as 3/4 mile from the southern and eastern sides of the islet. Poelau Kalangbahoe (Kalangbahu), an islet nearly 1 mile east-northeastward of Poelau Bakau, is saddle-shaped when observed from northward or southward. The eastern and higher of two peaks on Poelau Kalangbahoe is 259 feet high. Poelau Selemar, about 3 1/2 miles northwestward, and Poelau Koeel (Koeel) (Kuel), 154 feet high, about 3 miles north-northwestward, respectively, of Poelau Bakau, are covered with high trees; each has a reef border. Foul ground extending about 1 1/2 miles southward from Poelau Koeel is marked by discoloration; portions of it dry.

Middle Passage, which connects Macclesfield Straat with Clement Straat, is described in section 6-15.

6-11 Narrows of Macclesfield Straat.—The greater part of Poelau Lepar, which forms the western side of the narrows of Macclesfield Straat, is low and wooded but a ridge of hills extends westward along the southern shore of the island from Tandjoeng Meroen. Beikit Moedjoek (Mujuk), a 580-foot peak about 3 3/4 miles west-northwestward of Tandjoeng Meroen, is conspicuous. A hill, located about 1 mile northwestward of Beikit Moedjoek, is 617 feet high, and the most prominent peak. The point itself is 200 feet high and rocky; a rock above water lies close eastward of it.

Tandjoeng Laboe (Labu), the eastern extremity of Poelau Lepar, is low, and has a reef border on which are a number of rocks above water. Bakoeng, a 351-foot hill, lies about 1 1/2 miles westward of the point. Tandjoeng Laboe should not be approached closer than 2 1/2 miles to avoid a number of rocks and shoals. A white iron framework structure, 72 feet high, stands

on the point. It is a disused lighthouse. A 4½-fathom patch and a 2-foot patch lie 3½ miles eastward and 3½ miles northward, respectively, of the disused lighthouse.

Poelau Liat, a reef-bordered island on the eastern side of the narrows of Macclesfield Straat, is low and flat, and everywhere wooded except on a ridge of hills in the southern part. Keladi, 449 feet high, is one of the highest of peaks of this ridge. A spit that partly dries extends as far as 3 miles southward from the southeastern extremity of the island.

Poelau Tjelaka, a rocky, vegetation-covered islet, lies on the reef border extending from the western shore of Poelau Liat. Poelau Tjelaka serves as a good landmark. Several reefs lie westward and northwestward of the islet, and it should not be approached closer than 2 miles. A disused lighthouse (2°52' S., 107°01' E.), consisting of a white iron framework structure 46 feet high, stands on the islet.

Discovery, a group of rocks which are steep-to and dry, lies in the middle of the narrows of Macclesfield Straat, in a position about 4 miles west-southwestward of Poelau Tjelaka. The usual route through the strait passes eastward of these rocks.

Alceste Rif is a coral formation, with numerous drying heads, extending as far as 1 1/2 miles off the northwestern shore of Poelau Liat.

6-12 Northern part of Macclesfield Straat.—A 5½-fathom patch of coral, the easternmost danger in this part of the strait, lies about 10 miles southeastward of Tandjoeng Berikat, the east extremity of Bangka.

Wilson Bank, over which the least depth is 1¾ fathoms, lies about 6½ miles south-south-eastward of Tandjoeng Berikat.

Nutshorn Bank, westward of Wilson Bank, is a projecting spit of the coastal bank. It has a depth of 10 feet on its outer end. A rock with a depth of 5 feet is located on this shoal bank, about 6 miles southward of Tandjoeng Berikat. A 5-foot shoal lies on the coastal bank, about 3 miles south-southeastward of Tandjoeng Berikat.

Boompjes Eiland, about 9½ miles northeastward of Tandjoeng Berikat, and other islets and dangers in the vicinity are described in sections 6-42 to 6-48.

6-13 Directions for Macclesfield Straat.—

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From the southward: Make for a position about 4 miles westward of Hippogriffe, thence make good a course of 005° to pass westward of Fairlie and Blas Mateu, when land will soon be sighted. Note that the Shoalwater Island should not be sighted by day. When past Blas Mateu steer to pass about midway between Drievadem Bank and Sittart Reefs, taking note of the 4½-fathom patch about 5½ miles southward of Drievadem Bank and the 3-foot rock which lies 11½ miles southeastward of Tandjoeng Meroen and thence northward to pass between Discovery and Poelau Tjelaka. Note that the latter islet should not be approached closer than 2 miles; note also the 4¾-fathom patch about 3½ miles eastward of Tandjoeng Laboe. When the northern extremity of Poelau Liat bears 090° steer to pass eastward of Poelau Gaspar (sec. 6-42) or eastward of Tandjoeng Berikat, according to destination. Tandjoeng Berikat should be given a wide berth; the coastal bank, of which Wilson Bank is an outer portion, extends as far as 4 miles south-southeastward from the point, and there is, moreover, often a strong current off the point. The existence of the 5 1/2 fathom coral patch about 10 miles south-southeastward of the point should also be noted.

In thick weather it is considered advisable to anchor on the bank around Hippogriffe, where depths of 7 to 10 fathoms are available, and await more favorable navigating conditions. It should be remembered that vessels coming from the Java Sea and uncertain of their positions can approach the coast of Sumatra to a depth of 9 fathoms.

From the northward: Poelau Gaspar, the island in the approach to Gaspar Straten from the northward, and adjacent features are described in sections 6-42 to 6-48. The northeast coast of Bangka is described in sections 6-44 to 6-75.

It should be borne in mind that weather clear enough to assure good visibility is advisable before starting through Gaspar Straten from the northward. Otherwise, it is better to proceed through Straat Bangka. Once Tandjoeng Berikat is sighted, however, the entrance to Macclesfield Straat presents no difficulty, and the directions just given for proceeding through the strait from the southward can be followed in reverse order.

At night: It is advisable to sight Tandjoeng

Meroen during daylight if approaching from the southward, and Tandjoeng Berikat if approaching from the northward, before proceeding through the channel.

6-14 CLEMENT STRAAT (STRAIT).—The western side of this strait is formed by the Sittart Reefs (sec. 6-10), Poelau Kalangbahoe, and Poelau Koeel; the eastern side is formed by Poelau Aoer and Poelau Kelemar. The channel thence passes eastward of Poelau Liat.

6-15 Islets and dangers.—The islets Poelau Kalangbahoe and Poelau Koeel have been described in section 6-10. De Brauw, a reef which partly dries, lies about 1 mile northeastward of Poelau Kalangbahoe; in the intervening channel the depths are 13 fathoms. Poelau Aoer (Aur) and Poelau Kelemar are hilly, reef-surrounded islands covered with heavy timber. A useful mark for Poelau Aoer is its peculiar sharp summit, 174 feet high. Both islands are surrounded by reefs, and foul ground extends nearly 1 mile southward from Poelau Aoer. A very narrow channel passes between these islands. It is only about 400 yards wide between a rock, with a depth of less than 6 feet, which lies on the shoals extending southeastward from Poelau Kelemar and depths of 8 feet which are found on the coastal bank extending northwestward from Poelau Aoer.

A rock known as Gevaarlijke Klip (Dangerous Rock), with a least depth over it of 4 feet, lies in Clement Straat fairway in a position about 2 miles westward of Poelau Kelemar. The southern extremity of Geresik in range with the northern extremity of Poelau Aoer, bearing about 113°, leads about 440 yards northward of this fairway danger.

Tominkor, a partly drying shoal formation, lies on the western side of the fairway through Clement Straat. The drying head is charted about 3 1/2 miles northward of Poelau Koeel. The shoal is marked by discolored. Korall Rif lies about 1 1/2 miles east-northeastward of the south extremity of Poelau Liat, and also on the west side of the fairway. This small formation is awash.

Hewitt Shoal is a steep-to coral reef in the approach to Clement Straat from the north-

ward in a position about 5 miles north-northwestward of Poelau Kelemar. The least depth over the reef is 13 feet; it is not marked by discolored.

Akbar, a small, steep-to shoal of sand and coral, lies about 19 miles northward of Poelau Kelemar. The least depth over the shoal is 4 feet, and it is dangerous because it is not marked by discolored and also because sounding gives no warning of it.

Middle Passage is a channel, deep in the fairway, connecting Macclesfield Straat with Clement Straat. On the northern side of the channel are the dangers extending southward from Poelau Liat and Tominkor; on the southern side are Poelau Selemar and Poelau Koeel. Vessels proceeding eastward through Middle Passage can clear the dangers extending southward from Poelau Liat by keeping Poelau Kelemar bearing not more than 090° until Poelau Selemar bears more than 136°.

A channel connecting Macclesfield Straat and Clement Straat has Poelau Selemar and Poelau Koeel on its northern side, and Poelau Bakau and Poelau Kalangbahoe on its southern side. To proceed northeastward through this channel keep the southern extremity of Poelau Kalangbahoe in range, bearing about 091°, with the northern extremity of Poelau Bakau until Poelau Selemar bears 000°, when a fairway will open to the northeastward.

6-16 Directions for Clement Straat.—From the southward follow the directions given for Stolze Straat (sec. 6-26) as far as the Shoalwater Island; thence steer for the entrance of the channel with the larger islet of that pair bearing 180° astern. When Poelau Kalangbahoe bears 270°, alter course to make good a course of 350° so as to pass between Gevaarlijke Klip and Poelau Kelemar, and thence between Tominkor and Hewitt Shoal.

It is inadvisable to attempt Clement Straat at night. The lighted aids in this area are so placed as to make Stolze Straat the preferred channel at night.

6-17 STOLZE STRAAT (STRAIT).—The principal formations on the western side of this strait are the Shoalwater Islands, Poelau Kelemar, Poelau Silioe, Lima Eiland, and

Poelau Mendanau are the more noteworthy formations on the eastern side of the strait.

6-18 Southern part of Stolze Straat.— Larabe, Middle Reef, Branding Reef, and the Shoalwater Islands have been described in sections 6-5 and 6-6.

Carnbee, a group of three small steep-to coral reefs lying within a distance of 1 1/4 miles of each other, is centered in a position about 19 miles southward of Tandjoeng Genting, the southwestern extremity of Billiton. The southwestern patch dries, and over the others the depths are 2 fathoms or less. At high water and with a calm sea it is difficult to locate the group by eye from distances of more than 200 yards; in clear weather, however, the mountains of Billiton can be seen from positions southward of the group, and the western peak of Goenoeng Bagienda, a hill near Tandjoeng Genting, then appears as two hummocks. (See also sec. 6-29.)

6-19 KARANG NAGA (3° 27' S., 107° 37' E.), nearly 12 1/2 miles southward of Tandjoeng Genting, is a small formation of coral and large rocks over which the least depth is 4 feet. It is frequently marked by tide rips, but rarely by discoloration.

Aanvang Bank, about 2 1/2 miles northward of Karang Naga, consists of two drying patches of sand and large black rocks, some of which are above water and may be seen from distances up to 4 miles at low water.

Cooper, a shoal over which the depth is 3 feet, lies about 2 1/2 miles north-northwestward of Aanvang Bank and about 7 1/2 miles southward of Tandjoeng Genting. A reef, over which the depth is 2 feet and which is marked Quarter-fathom Rif on some charts, lies about 4 3/4 miles northwestward of Cooper, and between these formations are shoals with depths of 4 to 5 fathoms over them.

6-20 POELAU SELIOE (Selioe), an island with a maximum dimension of 3 3/4 miles in a north and south direction, lies with its southern extremity in a position about 5 miles westward of Tandjoeng Genting. Marang Bolo is a 226-foot hill near the southern extremity of the island. From distances of 12 to 16 miles Poelau Selioe appears as two islets by reason of this hill near the southern extremity and high trees near the northern extremity. Several rocks above water stand

on a reef bordering Poelau Selioe. Poelau Sariboe (Saribu) is a small islet in the channel between Poelau Selioe and the Billiton shore; this channel is navigable only by native praus. Batoe Sariboe is a white rock about 1,200 yards southeastward of Poelau Sariboe.

Witte Klip (Batoe Malang) is a rock, 28 feet high, lying about 3 miles westward of the southern extremity of Poelau Selioe. Karang Tiga is a shoal, over which the least depth is 1 fathom lying about 1 3/4 miles northwestward of Witte Klip.

Koerier (Karang Gosong) is a drying reef of small extent lying about 3 miles northward of Witte Klip. The summit of Goenoeng Beleroe (Beluru), an 1,184-foot hill about 6 1/2 miles northeastward of Tandjoeng Genting on Billiton, in range bearing about 077° with the northern extremity of Poelau Selioe leads about 400 yards southward of Koerier.

Teree Riffen (Karang Rangas), a compact formation of several drying reef patches, lies centered in a position about 4 1/2 miles northwestward of the northwestern extremity of Poelau Selioe. The westernmost patch is marked by a beacon with a topmark of two red cylinders. The middle peak of Goenoeng Bagienda in range bearing about 104° with the northern extremity of Poelau Selioe leads between Teree Riffen and Koerier in a depth of about 4 1/3 fathoms, soft bottom.

Zuid Rif (South Reef) is a drying reef about 3 1/2 miles northwestward of Teree Riffen; the reef is difficult to discern. At high water the reef is marked by a dark brown coloring and current rips.

6-21 NARROWS OF STOLZE STRAAT.— Lima Eilanden (Lima Islands) is the name applied to a formation of 6 islets lying on the eastern side of the southern part of the Stolze Straat narrows.

The islets are relatively small; they vary in height from 42 to 170 feet, are tree-covered, and surrounded by a number of drying coral patches. They can be considered as divided into a west group of 4 islets and an east group of 2 islets, separated by a deep channel about 3/4 mile wide.

A beacon, about 15 feet high, was reported to be located on Pulau Kasenga (1962).

6-22 POELAU BAMIDJO (Roe) (3° 05' S., 107° 22' E.) is the southernmost islet of the west group. In order northward the others are:

Poelau Bago (Boentar), Poelau Benolo (Pandjang), and Poelau Kasenga (Bankai). The latter is about 2 1/4 miles northward of Poelau Bamidjo. A stranded wreck lies about 1/2 mile southward of Poelau Bamidjo. Karang Loemba, a drying patch, is about 3/4 mile southeastward of the same islet, and nearly 1/2 mile west-northwestward of the same islet is a reef over which the depth is 1 3/4 fathoms.

A reef, over which the least depth is about 3 feet, lies about 1/2 mile southwestward of Poelau Kasenga, and with the exception of this reef and the one westward of Poelau Bamidjo, the western or Stolze Straat side of the Lima Eilanden is clear. Eastward of a line joining Poelau Kasenga and Tandjoeng Ajer Lantjoer, the western extremity of Poelau Mendanau to the northward, there are dangers numerous enough to warrant avoidance. A bank, with a depth of 11 fathoms was reported (1948) to lie about 8 1/4 miles west-southwestward of Poelau Kasenga.

Poelau Boejoet (Ringgit) and Poelau Lima are the two islets forming the eastern group of the Lima Eilanden. They lie close together in a position about 2 miles eastward of Poelau Kasenga. The eastern islet is Poelau Lima.

6-23 Poelau Mendanau, on the eastern side of the Stolze Straat narrows, lies with its western extremity, Tandjoeng Ajer Lantjoer, in a position about 10 miles northward of Poelau Kasenga. The island has a maximum length, in an east-west direction, of about 9 miles; it is wooded throughout, and is hilly in the western and northwestern portions. Petaling, a hill 679 feet high, is in about the middle of the island. Another summit, Sago-weel, is about 2 miles southeastward of Tandjoeng Ajer Lantjoer, and has a rounded summit 633 feet high. The shores of the island are generally low, with a rocky point here and there. Tandjoeng Ajer Lantjoer is a high, blunt point fringed by a narrow, steep-to reef. A detached reef lies about 200 yards southwestward of the point. Tandjoeng Ajer Lantjoer Light is shown on the point. The shores of the island northeastward and southeastward of the point are reef-fringed, with numerous rocks as far as 1 1/2 miles off shore. Poelau Peling is a small islet rising from the reef border in a position about 2 1/2 miles south-southeastward of Tandjoeng Ajer Lantjoer. Hoog Eiland (Kemboeng) is an is-

let 197 feet high, lying about 1 1/4 miles northward of the same point; this very conspicuous islet has a rounded summit and rises from a drying reef patch.

Poelau Nadoek (Nado) is a low, wooded islet separated from the southeastern shore of Poelau Mendanau by a narrow channel, Selat Nadoek (Nado), available only to small native craft. A reef on the south side of the channel and about 600 yards off the north end of Poelau Nadoek is marked by a beacon surmounted by a black cone. The coastal reef on the northwest side is marked by four beacons, of which the northeasternmost is surmounted by a ball. Pulau Bato endinding, 257 feet high, is an island separated from the northwest shore of Poelau Mendanau by Selat Nasi, a narrow channel also available only to small native craft. Nasi, the principal village, is located on the north coast of the island. Poelau Langir is a high, rocky islet lying in a position about 5 miles north-northeastward of Tandjoeng Ajer Lantjoer. The islet rises from an area of drying reef which has on its western edge a vegetation-covered rock, Malang Wangkang. Tandjoeng Ajer Lantjoer in range, bearing about 180°, with Hoog Eiland, leads a mile or more westward of Malang Wangkang, and also clear of the reefs between Hoog Eiland and Poelau Langir.

Poelau Geresik is an islet lying on the western side of the narrows of Stolze Straat in a position about 8 miles south-southwestward of Tandjoeng Ajer Lantjoer. The thickly wooded islet rises from a steep-to reef to a height of 116 feet. The depths are 4 fathoms or less as far as 1/2 mile from the eastern, or Stolze Straat, side of the islet. A reef, with a depth of 6 feet or less, extends about 600 yards southeastward from Poelau Geresik. Poelau Aoer and Poelau Kelemar, islets 2 miles westward and 3 miles northwestward, respectively, of Poelau Geresik have been described in connection with Clement Straat (sec. 6-14). In the channel, about 2 miles wide, between Poelau Geresik and Poelau Aoer, is a shoal of 1 3/4 fathoms. A 2-fathom shoal extends from the eastern end of Poelau Kelemar to a distance of about 1 mile in the direction of Stolze Straat.

6-24 Northern part of Stolze Straat.—There are few marks of use for position-finding along the east side of the north part of Stolze Straat northward of Tandjoeng Pandan. (For a description of the roadstead off Tandjoeng Pandan see sections 6-34 to 6-41.) The east side of the strait is formed by the west coast of Billiton and off-lying rocks and shoals. A double-peaked mountain nearly in the middle of Billiton is noticeable. The southeastern peak, Goenoeng Tadjemlaki (Tajem Laki), 1,663 feet high, consists of a narrow ridge appearing sharp when seen from eastward or westward, but blunt and somewhat rounded when seen from northward or southward. The northwestern peak, Goenoeng Tadjembini (Tajem Bini), 1,650 feet high, is a sharply pointed cone. Goenoeng Tobalo (Tabalo), a summit about 4 1/2 miles southward of Tandjoeng Kelajang, the northwestern extremity of Billiton, has three peaks of which the southernmost and highest is 538 feet high. Goenoeng Boeling (Buling), a summit, 371 feet high, lying about 2 miles northwestward of Goenoeng Tobalo, has a regular dome-shaped appearance from the northward or westward.

The Billiton coast between Tandjoeng Koeboe (Kubu) ($2^{\circ} 42' S.$, $107^{\circ} 37' E.$) and Tandjoeng Binga, a high point about 6 miles to the northward, is low. The foreshore is as wide as 1 mile in places. Several rocks, the outer one of which is covered with vegetation, lie on this foreshore off Tandjoeng Koeboe; only the outer dangers are considered in this description.

A number of shoal patches, with depths of 1 3/4 to 5 fathoms over them, extend parallel to the coast between Tandjoeng Koeboe and Tandjoeng Binga. The southernmost is about 5 1/4 miles west-northwestward of Tandjoeng Koeboe; the northernmost is about 3 1/2 miles westward of Tandjoeng Binga. Not all these patches have been named.

A number of islets, mostly hilly and with many reef patches around them, lie off Tandjoeng Kelajang, the northwestern extremity of Billiton. This point is about 3 3/4 miles north-northeastward of Tandjoeng Binga. One of the outermost islets, Poelau Langkoeas (Langkuas), lies about 3 miles west-northwestward of the point and is hilly. Poelau Langkoeas Light ($2^{\circ} 32' S.$, $107^{\circ} 37' E.$) is shown near the east end of the islet.

Alwina, a shoal with a depth of 10 feet over it, lies about 1 1/4 miles north-northeastward of Poelau Langkoeas. This danger, the northernmost in the area, is not marked by surf or discoloration.

A dangerous shoal lies about 12 1/2 miles west-northwestward of Poelau Langkoeas; its charted position is approximate.

6-25 Anchorages.—Anchorage can be taken in 7 to 8 fathoms, clay and sand, on the eastern side of the bank extending southward from Shoalwater Island. The islet must be kept bearing less than 359° .

Anchorage can also be taken westward of Teree Riffen, in 8 to 9 fathoms, in a position with Poelau Lima, the easternmost islet of the Lima Eiland, bearing 340° . Anchorage can also be taken southward of Poelau Lima, with the eastern extremity of that islet bearing 000° and Poelau Bamidjo bearing 298° . The depths in this position are 6 1/2 to 10 fathoms. Note that this position is about 3/4 mile southward of the reefs lying southward of Poelau Lima and about 1 1/2 miles northwestward of Zuid Rif.

Good anchorage can also be taken, in 8 fathoms, on the ridge extending southward from Poelau Geresik, in a position with the eastern side of the islet bearing 355° and the southern extremity of Poelau Acer bearing 293° .

Vessels with local knowledge can take convenient anchorage in 7 fathoms, hard sand, in a position with Hoog Eiland bearing 215° , distant about 1 mile. Anchorage can also be taken eastward of the same islet in about 11 fathoms. Care is necessary to avoid the reefs in this locality.

Good anchorage, in 8 to 9 fathoms, sand, can be taken in a position about 700 yards southward of Poelau Langkoeas. This position can be approached from the southwestward by steering 090° for the summit of Poelau Kepajang, an islet about 2 miles east-southeastward of Poelau Langkoeas. Marks of use for identifying Poelau Kepajang are a hill, 121 feet high, on its northern part and its rocky western shore; it rises from a large drying reef that has on its northern extremity an islet with a high rock close off it. Note that there is a shoal, with a depth of 18 feet over it, which lies about 1/2 mile south-southeastward of

Poelau Langkoeas Light. A sandy beach on the southern side of Poelau Langkoeas, westward of a rock, is the best place to land on the island.

6-26 Directions for Stolze Straat from the southward.—Shape course for Larabe during the northwesterly monsoon and for Carnbee during the southeasterly monsoon. Note that in clear weather the mountains in the southwestern part of Billiton will be sighted from positions some distance southward of these dangers. Goenoeng Loe-dai (Ludai), a hill on Billiton which may be sighted from positions as far as 12 miles southward of Carnbee, usually comes into view first and then shortly afterward Goenoeng Beloeroe (sec. 6-29) will be sighted. As soon as Goenoeng Beloeroe can be sighted, bring it to bear about 20° , and with it in sight on that bearing, if the weather be clear, a vessel will be about 33 or 35 miles distant from it, and may with caution, shape a course for the strait. From positions near Larabe, other mountains on Billiton should be sighted, as well as the Shoalwater Islands, so that in clear weather there should be no difficulty in making the strait.

When the vessel's position has been determined, a northerly course may be steered, passing about 6 miles eastward of the Shoalwater Islands, thence midway between Poelau Kasenga and Poelau Geresik, and thence not less than 2 miles westward of Tandjoeng Ajer Lantjoer.

During thick weather or with poor visibility recourse must be had to sounding. In such cases it is advisable to make the southern edge of the bank, with depths of 7 to 10 fathoms, clay with sand, extending about 28 miles southward from the Shoalwater Islands, by sounding, and then immediately steer eastward until in depths of more than 10 fathoms; then steer northward, taking care to keep in depths of more than 10 fathoms, and when passing eastward of the Shoalwater Islands keeping in depths of not less than 16 fathoms. If depths of over 20 fathoms have been obtained when making for the southern entrance it may be presumed that the vessel is well over on the eastern side of the channel, and a northwesterly course may then be steered, taking care to keep in these depths. If there exists any doubt as to which side of the strait the vessel is on, it is advisable to anchor. It is of interest to note that

bad visibility conditions do not usually last for any length of time.

Stolze Straat can be entered from the southward at night without danger in clear weather, as Shoalwater Island Light is visible as far as 3 miles southward of Hancock, the southernmost danger on the western side of the approach. Note that a dangerous wreck (sec. 6-7) lies about $12\frac{1}{4}$ miles south-southeastward of Shoalwater Island Light. When this light is sighted a course should be steered to pass about 6 miles eastward of the Shoalwater Islands, and thence northward until in the arc of visibility of Tandjoeng Ajer Lantjoer Light, which must be kept between the bearings 3° and 22° . When Poelau Geresik is sighted the vessel's position can be fixed by bearings of that island and Tandjoeng Ajer Lantjoer Light, and course then shaped to pass either eastward or westward of the shoal Akbar according to destination. Note that vessels passing eastward of that shoal will have the advantage of being able to fix their position by bearings of Poelau Langkoeas Light in addition to Tandjoeng Ajer Lantjoer Light.

6-27 Directions for Stolze Straat from the northward.—Vessels approaching the strait from the northward must, especially if the position is not certain, give the group of reefs (sec. 6-43) lying between 40 and 50 miles northeastward of the northeastern extremity of Bangka a wide berth. Farther southward attention must be paid to the dangers (sec. 6-42) lying off the northern entrance to Gaspar Straten, the easternmost of which is the rock Canning. The isolated reef, over which the least depth is 2 fathoms and which lies about 47 miles northward of Poelau Langkoeas must also be borne in mind as well as the dangerous wreck which lies about 3 miles southeastward of this isolated reef and the reef reported to lie about $12\frac{1}{4}$ miles west-northwestward of Poelau Langkoeas. Vessels approaching from the northeastward must avoid Florence Adelaide reef (sec. 7-51).

When southward of the line joining Tandjoeng Berikat and Poelau Langkoeas the only danger in the northern part of the strait is Akbar; vessels passing eastward of this shoal and near Poelau Langkoeas must guard against the peculiar nature of the tidal currents (sec. 6-3) in the vicinity of

this islet. The directions given for Stolze Straat from southward can then be followed in reverse order.

6-28 WESTERN COAST OF BILLITON.—

The western coast of Billiton is wooded and generally low, but has a few hills, mountains, and ridges inland that form useful marks. The ridges nearly all run in an east-northeast and west-southwest direction, and show flattish summits, with gently sloping sides, when seen from the northward or southward, but more pointed, with fairly steep sides, when seen from the eastward or westward.

6-29 Goenoeng Bagienda (3°13' S., 107°37' E.)

a mountain about 2 miles northeastward of Tandjoeng Genting, the southwestern extremity of Billiton, is a rocky hill, 531 feet high; the westernmost of its two peaks is rather sharp. Goenoeng Beloeroe (Beluru), about 1,184 feet high and about 5 miles northeastward of Goenoeng Bagienda, is a long, narrow ridge that, when seen from eastward or westward, is rendered conspicuous by a small wood on its northern side. Goenoeng Koera, a summit 672 feet high, is about 1 mile east-southeastward of Goenoeng Beloeroe. Goenoeng Loedai (Ludai), a twin-peaked summit, is about 3 miles east-northeastward of Goenoeng Koera. Goenoeng Koebing (Dudat), a mountain 1,171 feet high and lying nearly 7 miles northward of Goenoeng Beloeroe, has a ridge extending about 5 miles northeastward from it. Goenoeng Agong, a summit 1,223 feet high at the northeastern end of this ridge, has two peaks of which the easternmost is the higher.

Tandjoeng Genting, the southwestern extremity of Billiton, is a rocky point, and close off it is Poelau Genting, a tiny islet. The points Tandjoeng Keras and Tandjoeng Lantjang, 1 1/2 and 2 3/4 miles, respectively, north-northwestward of Tandjoeng Genting, are also rocky. Poelau Peroet, a small islet with some rocks above water close off its northern side, lies close off Tandjoeng Keras where there is a stone landing pier. Tandjoeng Tambelan and some above-water rocks lies within 3/4 mile northward of Tandjoeng Lantjang. Poelau Seloe and the out-lying dangers in this vicinity have been described (sec. 6-20) in connection with Stolze Straat.

The western coast of Billiton between Tandjoeng Lantjang and Tandjoeng Borong, about 16 1/2 miles north-northwestward, is fronted by banks, reefs, and low islands as far as several miles westward, or in the direction of Straat Mendenau. The chart is the best guide for the positions, dimensions, and depths over these various formations. Telok Brang, the extensive indentation just southward of Tandjoeng Borong, is available only to native craft. Tandjoeng Tikar is about 9 miles north-northeastward of Tandjoeng Borong. Off this section of the western coast of Billiton are a number of shoals, reefs, and islets which form a portion of the eastern side of the narrows and also the eastern side of the northern part of Straat Mendenau.

6-30 STRAAT MENDANAU.—This channel branches off northeastward from the southern part of Stolze Straat to lead inshore, or eastward, of the islands Poelau Lima, Poelau Nadoek, and Poelau Mendenau to the roadstead Reede Tandjoeng Pandan. Straat Mendenau has controlling depths of 3 1/4 to 5 fathoms from the chart, and can be used by vessels with local knowledge. A number of beacons and buoys are normally available to mark the channel.

6-31 Southern entrance.—The strait is entered from the southward between the beacon-marked Teree Riffen (sec. 6-20) and Zuid Rif, about 3 1/2 miles to the northwestward. A ridge, over which the depths are 3 1/4 to 4 1/2 fathoms, extends northward from Teree Riffen to the reefs which extend about 3 miles southward from Poelau Nadoek. A vessel must cross this ridge to enter the deep water of the strait. The east side of the strait in this part is bordered by the reef-studded flats extending from the Billiton coast. Poelau Mendulu, a low island on the shoal flats, lies southeastward of Poelau Nadoek. The strait passes about 1 mile westward of this island. Two drying reefs lie near the edges of the channel, respectively, westward of Poelau Mendulu. Beacons, marked in accordance with the New Uniform System, stand on these reefs. A reef, over which the depth is 5 feet, lies about 400 yards south-southeastward of the

reef on the west side of the strait.

6-32 **Narrows of Straat Mendanau**.—From northwestward of Mendulu the strait trends north-northeastward between the islands of Poelau Nadoek and Poelau Sikindang on the west side, and a number of reef-fringed islets on the east side. A rock lies awash in a position about 600 yards northward of the north extremity of Poelau Sikindang. A reef which dries lies about $1\frac{1}{4}$ miles northward of the same extremity. A rock lies awash, about $\frac{1}{4}$ mile west-southwestward of this reef. About 5 miles north-northeastward of Poelau Sikindang on the east side of the strait is Poelau Tikoes, a small rocky islet marked by coconut trees. The strait narrows to about 1 mile width between Poelau Tikoes and Poelau Sebongkok, a large islet westward of it. A $3\frac{1}{4}$ -fathom patch lies in a position about $\frac{1}{2}$ mile eastward of the north part of Poelau Sebongkok. The channel then passes eastward of Hoorn Eiland, which has a 134-foot hill near its northeastern extremity.

Perlak, a cluster of reefs of which some dry, is the northernmost formation on the western side of Straat Mendanau. This cluster lies about $2\frac{1}{2}$ miles north-northwestward of the 134-foot hill at the northeastern extremity of Hoorn Eiland. Reefs and shoal patches extend southwestward from Perlak, so that passage should not be attempted westward of the cluster. A reef patch, over which the depth is 10 feet, lies about 800 yards east-northeastward, or on the channel side, of the drying portion of Perlak. A black conical buoy, with a black conical topmark point up, is moored about $\frac{1}{2}$ mile northeastward of the drying portion of Perlak.

Poelau Kelmanbang, a small island covered with vegetation and marked by coconut trees on its southern and eastern sides, lies on the eastern side of Straat Mendanau in a position nearly 4 miles northward of Poelau Tikoes. The fairway through the strait passes westward of Djoemangin, a rock awash about $1\frac{1}{2}$ miles westward of the western extremity of Poelau Kelmanbang. On the fairway side of the rock is a red can buoy

with a truncated conical topmark. A beacon, surmounted by a red cylinder, is also on the eastern side of the strait in a position about $1\frac{1}{4}$ miles southward of the western extremity of Poelau Kelmanbang, and marks a $2\frac{1}{4}$ -fathom shoal patch on which is a rock. The area between the coast of Billiton to the eastward and lines connecting the buoy, beacon, and Poelau Tikoes, is encumbered with numerous shoals and reefs.

At its northern end Straat Mendanau opens to the northwestward, passing between lines of shoals extending west-northwestward from Perlak on the southwestern side and, on the northeastern side, similar lines of shoals extending north-northwestward from Djoemangin. The outermost shoal on the southwestern side of the outlet is a $3\frac{3}{4}$ -fathom patch lying about $3\frac{1}{2}$ miles west-northwestward of Perlak; the outermost shoal on the northeastern side is a $2\frac{3}{4}$ -fathom patch lying about $3\frac{1}{2}$ miles north-northwestward of Djoemangin. A 7-fathom patch lies about $2\frac{1}{4}$ miles north-northwestward of Perlak.

6-33 **Directions for Straat Mendanau**.—To proceed through the strait from the southward steer northward so as to pass about $1\frac{1}{2}$ miles westward of the beacon on Teree Riffen, and when the south point of Poelau Mendoeloe bears 040° , steer for it on that bearing so as to cross the ridge between Teree Riffen and Poelau Nadoek in a least depth of 26 feet.

After crossing this ridge steer a course of 005° until the beacon southward of Poelau Nadoek and the beacon northwestward of Poelau Mendoeloe are sighted. Note that these will be sighted soon after crossing the ridge. Pass between the beacons just mentioned and thence steer north-northeastward so as to pass about $1\frac{1}{2}$ miles eastward of Poelau Sikindang, and thence midway between Poelau Sebongkok and Poelau Tikoes, taking care to avoid the $3\frac{1}{4}$ -fathom patch nearly $1\frac{1}{2}$ miles off the eastern shore of Poelau Sebongkok.

Thence pass westward of the beacon marking the reef westward of Batoe Pinang and westward of the buoy off the western side

of Djoemangin. The northeastern extremity of Poelau Sebongkok in range with the eastern extremity of Hoorn Eiland, bearing about 178° , leads about 600 yards eastward of the detached reef, over which the depth is 10 feet, lying eastward of Perlak. Thence pass northeastward of the buoy that is moored about $\frac{1}{2}$ mile northeastward of the drying portion of Perlak and westward of the $2\frac{1}{2}$ -fathom shoal, forming the outer danger on the northeast side of the northern outlet of Straat Mendenau, which lies about $3\frac{1}{2}$ miles north-northwestward of Djoemangin. If bound for Reede Tandjoeng Pandan, steer east-northeastward, after rounding this shoal, so as to pass southeastward of the light buoy moored about $\frac{1}{4}$ mile westward of the two 28-foot shoals and northwestward of the buoy moored about $3\frac{1}{4}$ miles west-northwestward of Tandjoeng Pandan Light.

6-34 REEDE TANDJOENG PANDAN.—Between Tandjoeng Tikar ($2^{\circ}48' S.$, $107^{\circ}35' E.$) and Tandjoeng Koeboe, about 6 miles north-northeastward, the Billiton coast is indented by a bay into which a river, the Soengai Tjeroetjoep flows.

Reede Tandjoeng Pandan is the roadstead off the entrance of this river.

6-35 Depths—Channels.—A swept channel, about 600 yards wide and with a least depth of $4\frac{1}{4}$ fathoms, trends east-southeastward from seaward toward the outlet of the river. The inner end of this swept channel is northward of the northwestern end of a reef; on the southern side of the inner end is a light buoy (see sec. 6-37).

From the inner end of the swept channel a narrow channel leads between reefs on either side to the river entrance; this narrow channel has a least depth of $3\frac{3}{4}$ fathoms for a distance of nearly $1\frac{1}{2}$ miles. The depths thence shoal steadily to as little as 3 feet at the entrance itself.

Ocean-going vessels do not enter the river, but anchor either in or near the swept channel or in an inner anchorage area.

Practically the entire bay, except for the narrow channel just mentioned, is occupied by a drying coastal reef; Batoe Kidjang, at the outer edge of this reef, is nearly $3\frac{1}{4}$ miles west-northwestward of the entrance to the river. Outside this coastal reef are numerous detached reef patches, for the positions of which the chart is the best guide.

6-36 Marks.—The shore of the bay is low and wooded. Goenoeng Pajoeng (Paiung), a hill 203 feet high, stands $1\frac{1}{2}$ miles east-southeastward of the southern point of the entrance to the river. A flagstaff is shown on the chart in a position about $1\frac{1}{4}$ miles northwestward of Goenoeng Pajoeng.

Poelau Kelemmoa (Kalmoa), an islet on the southern side of the channel in a position about $1\frac{1}{4}$ miles westward of the southern point of the entrance to the river, has on its summit a conspicuous pyramid visible 12 miles. It was reported (1962) that this pyramid was obscured by trees until a ship is nearly abreast the light beacon. A boat pier extends northward from the northern side of Poelau Kelemmoa.

Tandjoeng Pandan Light is shown on the coastal reef in a position about 1 mile northwestward of Poelau Kelemmoa. The light beacon is on the southern side of the inner channel.

6-37 Shoals—Aids to navigation.—Two shoals, with depths of 26 feet over them, lie about $4\frac{3}{4}$ miles west-northwestward of the light beacon. A light buoy, with red and white vertical stripes, is moored about $\frac{1}{4}$ mile westward of these shoals. It was reported (1963) that this danger consisted of one shoal and was marked on its southwest side by the buoy just described. These and the shoal (sec. 6-33) at the northeastern extremity of Straat Mendenau are the outermost dangers in the channel to Tandjoeng Pandan.

A shoal, with a least depth of 10 feet over it, lies about 4 miles northwestward of the light beacon and on the northern side of the

(7519) INDONESIA — Billiton Island — Tandjung Pandan Road — Buoy changed.—The black and white checkered conical buoy in $2^{\circ}44'24''$ S., $107^{\circ}38'08''$ E. (approx.) has been replaced by a black and white checkered can buoy with a green diamond shaped topmark.

(N.M. 51/65.)

(B.P.I. 45 (360), Djakarta, 1905.)

H.O. Chart 5876 (Plan).

H.O. Pub. 71, 1951, page 115.

swept channel near its outer end. A red can buoy is moored close on the southwestern side of this shoal. Baka Reef, a group of shoals, including two rocks, with depths of less than 6 feet over them, lies about 1 mile eastward of the above 10-foot shoal.

A buoy, painted in black and white checkers, is moored on the north side of a reef, over which the depth is 28 feet, in a position about $3\frac{1}{4}$ miles west-northwestward of the light beacon. This buoy is on the south side of the swept channel.

Karang Tengah, a number of shoals with depths of 10 to 18 feet, extends about $3\frac{1}{4}$ miles northwestward from the light beacon. These dangers lie off the south side of the swept channel.

Mangkok Besar, a shoal over which the least depth is 10 feet, lies off the northern side of the swept channel in a position about 2 miles northwestward of the light beacon. A red can buoy, surmounted by a red truncated cone, is moored about $\frac{1}{2}$ mile southward of the shoal.

A light buoy, painted in black and white checkers and showing a flashing white light, is moored off the northern side of Batoe Kidjang, the northwestern extremity of the coastal reef extending from the southern entrance point of the river. This light buoy is near the inner end of the southern side of the swept channel.

A conical buoy, painted in black and white checkers with a black diamond topmark, is moored about $\frac{1}{2}$ mile southeastward of Tandjoeng Pandan Light.

6-38 Inner channel markers.—The narrow channel along the northern side of Batoe Kidjang which leads to the inner anchorage area is well marked by beacons in accordance with the New International System.

6-39 Anchorages.—The anchorage for ocean-going vessels is about $1\frac{1}{2}$ mile northwestward of the light buoy moored off the northern side of Batoe Kidjang. The depth in this position is about 6 fathoms, and the bottom is sand; the 27-foot shoal in the fairway should be borne in mind. This anchorage is unsafe during the westerly monsoon, however, and at such times anchor-

age should be taken southward of Poelau Sebongkok in the northern part of Straat Mendenau.

Large vessels of deep draft usually anchor in 8 fathoms, about $1\frac{1}{2}$ miles northwestward of the light beacon.

The inner anchorage is in a fairly wide basin, with a least depth of 20 feet, close northeastward and eastward of the light beacon. However, the channel leading to it is only about 200 yards wide off the beacon. There is space in this basin for two vessels of about 400 feet in length and about 18 feet draft; both anchors are advisable. The basin affords good shelter during the southeasterly monsoon.

Anchorage is prohibited within an area bounded by a line drawn from Tandjung Pandan in a 298° direction for about $5\frac{1}{2}$ miles and thence to Tandjung Kubu.

6-40 Directions.—Vessels making for the roadstead should pass through the swept channel. The beacons on the northern side of the channel leading to the inner anchorage must be given a berth of at least 100 yards; the beacon on the southern side should be given a berth of 55 yards.

6-41 Village.—Tandjoeng Pandan ($2^{\circ}45' S.$, $107^{\circ}38' E.$), the headquarters of a government official, stands on the northern side of the outlet of the Soengai Tjeroetjoep.

Two piers extend southward into the channel of the river, where there are depths of 5 to 12 feet over a narrow area. The western pier is privately maintained. Another pier extends north-northwestward from its south shore opposite the redoubt.

Provisions, water, coal and oil are not available to shipping.

There is a small drydock near the redoubt in the eastern part of the town. Two lowpowered tugs and seven 100-ton lighters are available. Two wheeled-cranes of 7- and 10-ton capacity, respectively, serve the port.

The town is in telephonic and telegraphic communication with various places on Billiton; vessels connect the town with other ports of the East Indies. There is an airport about $7\frac{1}{2}$ miles from Tandjoeng Pandan; it is in regular air communication with Java, Bangka, Palembang, and Singapore.

A hospital is maintained in the town. Fever and beriberi are prevalent in this area; the climate is considered unfavorable.

6-42 ISLANDS AND DANGERS NORTHWARD OF GASPAR STRATEN.—Boompjes Eiland ($2^{\circ}28' S.$, $106^{\circ}58' E.$) lies about $9\frac{1}{2}$ miles northeastward of Tandjoeng Berikat, the easternmost point on Bangka. It is a bare rock about 36 feet high, and has a border of

reef that attains a width of about $\frac{1}{4}$ mile off its southeast side. A detached patch, with a depth of 6 feet, and a rock awash lie about $\frac{1}{2}$ mile southeastward and northeastward, respectively, of Boompjes Eiland. A 4 $\frac{1}{2}$ -fathom patch lies about $\frac{3}{4}$ mile northwestward of Boompjes Eiland.

Boompjes Eiland has been reported (1958) to be a good radar target at a distance of 20 miles.

Poelau Gaspar, a reef-fringed island about 6 $\frac{1}{2}$ miles northeastward of Boompjes Eiland, has a maximum length of nearly 1 $\frac{1}{2}$ miles. It is thickly wooded and has a sharp summit 774 feet high. The reef border off the eastern extremity of the island is 1/2 mile wide. Gelasa Rots lie about 1 mile westward of the western extremity of Poelau Gaspar. One of these bare rocks is 29 feet high.

A sunken wreck lies about 7 miles north-northeastward of Poelau Gaspar.

Canning is a submerged rock lying 9 $\frac{1}{2}$ miles east-northeastward of Poelau Gaspar; it has over it a least depth of 16 feet. The rock is steep-to and is not marked by discolored or ripples.

A reef, reported to break, lies about 12 miles southeastward of Canning Rock. See section 6-24.

Warren Hastings Riffen are comprised of four coral patches, and two rocks awash. The rocks awash are close together in a position nearly 7 $\frac{1}{2}$ miles west-northwestward of Gelasa Rots. The shoal patches, of 1 $\frac{1}{2}$ to 5 fathoms, are strung out northeastward from the rocks for a distance of more than 2 miles.

Tioeng (Tiung) Reef is a patch, having a depth of only 3 feet, lying about 10 $\frac{1}{2}$ miles north-northwestward of Poelau Gaspar. Other patches of 6 feet depth, lie about 1 mile northwestward of Tioeng.

Teree Reef, about 2 miles northeastward of Tioeng, is a drying bank on which are some rocks. A 4 $\frac{1}{4}$ -fathom shoal lies close southeastward of Teree. A dangerous rock lies about 1 $\frac{1}{2}$ miles westward of Teree, and patches of 3 $\frac{1}{4}$ and 4 $\frac{1}{4}$ fathoms lie nearby. A shoal, with a depth of 6 feet, lies $\frac{3}{4}$ mile southwestward of the dangerous rock.

Belvedere, a black, reef-fringed rock about 2 miles northward of Teree, is nearly 10 feet high. The depths as far as 1 mile eastward from Belve-

dere are 1 fathom to 5 fathoms.

Magdalena, a steep-to reef about 10 miles northward of Belvedere, has over it a depth of 2 $\frac{1}{4}$ fathoms.

Lanrick, a reef about 9 $\frac{1}{2}$ miles northward of Magdalena, has over it a least depth of 1 $\frac{1}{2}$ fathoms, and is steep-to. A shoal, with a depth of 2 feet, was reported (1955) to lie about 12 miles southwestward of Lanrick.

A reef (1° 46' S., 107° 31' E.) with a least depth of 2 fathoms, lies about 35 miles east-northeastward of Lanrick and nearly 47 miles northward of Poelau Langkoeas. A dangerous obstruction lies approximately 3 miles southeastward of this reef.

6-43 Reefs northeastward of the northeastern extremity of Bangka.—Between latitude 1° 04' S. and 1° 14' S. and longitude 106° 30' E. and 106° 47' E., in the approach to Gaspar Straten from northwestward, is a group of small, steep-to reefs not marked by discolored. Enslie, the westernmost of these reefs, is about 42 miles northeastward of Tandjoeng Samak, the northeastern extremity of Bangka. The depth over Enslie is 4 $\frac{3}{4}$ fathoms. Celestial, reefs with a depth of less than 6 feet over them, is the easternmost of the group. The group lies within a circular area with a 9-mile radius.

6-44 NORTHEASTERN COAST OF BANGKA.—The northeast coast of Bangka is about 86 miles long between Tandjoeng Berikat and Tandjoeng Samak. This section of coast is low and wooded. A few low hills stand near the water's edge; inland, however, are mountains visible from considerable distances from seaward. A few small rivers flow through this section of coast.

6-45 Landmarks.—The summit of the Pading Gebergte, 2,411 feet high, lies about 18 $\frac{1}{2}$ miles westward of Tandjoeng Berikat, and appears broad and flat when seen from the northward. The range thence extends westward for about 7 miles, showing several rounded peaks, to Gebang, a sharp peak 1,161 feet high. Valsche (False) Gebang, 1,362 feet high, lies about 2 miles northeastward of Gebang. Eastward of the summit of this range is a ridge of hills, with several sharp peaks, including Sapat, which is 656 feet high, and Telok Batoe. The latter peaks are 10 miles and 4 $\frac{3}{4}$ miles, respectively, westward of Tandjoeng Berikat.

(6522) **INDONESIA—Sumatra—East coast—Bangka—Chart amendment.**—
The red and white checkered buoy ($1^{\circ}57'10''$ S., $106^{\circ}21.0$ E.) has been relocated
in $1^{\circ}57'10''$ S., $106^{\circ}20'45''$ E.

See N.M. 36(5251) 1965.)

(N.M. 45/65.)

(B.P.I. 40(316), Djakarta, 1965.)

H.O. Chart 3112.

H.O. Pub. 71, 1951, page 117.

About midway along the coastal section between Tandjoeng Berikat and Tandjoeng Samak, and southward of Reede Pangkalpinang, is Mango (Mangkol) Gebergte, a range that rises at its southern end to a 1,378-foot peak. The latter is the highest and most conspicuous peak of the range and stands about 49 miles northwestward of Tandjoeng Berikat and about 7 miles inland. About 3 1/2 miles northward of this peak is Pau (Lapa Heuvel), a peak 919 feet high. Lali, a peak about 4 3/4 miles northeastward of Mangol, is 745 feet high and has a conspicuous tree on its summit.

Maras Gebergte has a triple-peaked summit standing about 22 miles southward of Tandjoeng Samak, and close southeastward of the head of Klabat Baai. The highest peak is 2,293 feet high. The formation is very conspicuous.

Raja (Radja), a conical hill 774 feet high, lies close westward of Tandjoeng Raja, and about 18 miles northward of Lali. Poeak (Puak), a hill 1,007 feet high, is about 1 1/2 miles southwestward of Raja. Poeak has a steep eastern side and a very conspicuous sharp summit. Pandjar (Panjar) is a range with a cone-shaped summit about 11 miles northwestward of Raja. It has a low ridge of hills on its eastern side. Sambongiri, a conical hill 771 feet high, is nearly 6 miles west-southwestward of Tandjoeng Raja. Besar, about 14 1/2 miles northwestward of Tandjoeng Raja, is a conical hill with a rounded summit appearing as a sharp peak when seen from northward or southward.

6-46 Channels through off-lying reefs.—A great number of islets, banks and reefs lie off this coast. The outermost, such as Van Sittard, Keuchenius, and Severn, are as far as 30 miles from the coast.

Three channels lead between the offshore formations to and from Reede Pangkalpinang. One (sec. 6-63) leads to that roadstead from the Gaspar Straten, passing southwestward of the reef Goat and southward of Koraal Generaal Elliot. Another (sec. 6-61) is an inshore passage from Reede Koba to Reede Pangkalpinang. The third (sec. 6-64) leads from Reede Pangkalpinang to Reede Soengai Liat.

Passage among the offshore formations should not be undertaken by other than these three channels. The number of new dangers found during the last survey strongly suggests the possibility that other undiscovered dangers are present. The

reefs are all steep-to, and, except under the most favorable conditions, are only slightly marked by discoloration. Note that only the islets and reefs near the channels mentioned above are described in the following sections; the chart should be studied for the other formations.

In fixing position by bearings it should be kept in mind that muddy points and islets may have worked out eastward since the last survey.

~~Van Sittard~~ Van Sittard (Vansittart Reef), the southeasternmost of the outermost dangers, lies about 23 miles north-northwestward of Tandjoeng Berikat, and has over it a depth of 8 feet. Keuchenius, a reef which is about 12 1/2 miles northwestward of Van Sittard, has over it a depth of 26 feet. Oost (East) Hydrograaf, a reef which lies about 5 miles westward of Keuchenius, has over it a depth of only 1 foot. West Hydrograaf, a reef about 8 1/2 miles northwestward of Oost Hydrograaf, has over it a depth of 11 feet. A shoal, with an estimated depth of about 2 feet, was reported to lie about 8 miles east-northeastward of Keuchenius. A shoal, with a depth of 3 1/4 fathoms over it, lies about 6 miles northward of Van Sittard.

Vessels proceeding to and from the Gaspar Straten should pass outside these formations. The dangers within these reefs are marked by discoloration only in very fine weather, and sounding is of little use in locating them. Note that in clear weather the hills and mountains on the Bangka shore can be seen from the outer reefs.

6-47 Currents.—Currents off the northeastern coast of Bangka originate both as tidal and monsoon drift phenomena. They are variable, particularly along the outer edge of the reefs and in the open sea, so that no reliance can be placed on positions determined by dead reckoning. Off Tandjoeng Berikat the monsoon drift may attain a considerable rate.

6-48 Coast.—The coast between Tandjoeng Berikat and Tandjoeng Langka (Lanka), about 25 miles westward, is low and, in places, swampy. The westernmost 7 miles of this section is fronted by numerous reefs, many of them drying, to distances as far as 3 1/2 miles offshore. Karang Timor, the easternmost of these, is partly above

water on its southwestern side, and lies about 6 miles eastward of Tandjoeng Langka and about 2 miles offshore. Karang Perleng, nearly 2 miles northeastward of Tandjoeng Langka, also has a small portion above water. These two reefs and another, Karang Barat, lying about 1 mile westward of Karang Perleng, are fairly steep-to on their northern sides.

6-49 REEDE KOBA.—A river, the Soengai Koba, flows into the sea by way of an outlet about 2 1/2 miles westward of Tandjoeng Langka. The roadstead off the outlet is bounded on the north by the parallel of latitude 2°24' S., eastward by the meridian of longitude 106°25' E., and westward by the meridian 106°22' E. A town, Koba, stands on the east bank of the river a short distance from the sea.

6-50 Dangers.—A drying reef lies about 1 1/2 miles north-northeastward of the outlet of the river. A **beacon**, with a ball topmark and painted in red and white horizontal bands, stands on the northern extremity of this reef.

Another drying reef lies about 1 mile northwestward of Tandjoeng Langka; two drying patches lie within 3/4 mile eastward of this drying reef. Karang Goentreng, a drying reef, lies about 2 1/2 miles westward of the beacon and about 1 1/4 miles offshore.

6-51 Anchorage.—The usual anchorage is outside the reefs in a position about 3/4 mile northwestward of the beacon, in a depth of 3 1/4 fathoms over a bottom of mud. Small vessels can anchor closer in, within the reefs.

Boats usually land at a place, marked by a flagstaff, about 1/2 mile eastward of the outlet of the river. During the westerly monsoon, landing is frequently impossible. Note that a red **light**, privately maintained, is exhibited at night from the flagstaff marking the landing place.

6-52 River.—The coast in the vicinity of the outlet of the river is fringed by a drying sand bank about 1/2 mile wide. The river is accessible only to native craft, and then only at high water springs. During the easterly monsoon the maxi-

mum depth that can be taken into the river is 4 feet; during the westerly monsoon the maximum depth is 5 feet.

6-53 Koba ($2^{\circ}29' S.$, $106^{\circ}25' E.$) is connected to the general telegraph system; regular communication by sea is available with other ports of Indonesia. A harbor doctor resides in the town.

6-54 NORTHEASTERN COAST OF BANGKA (*continued*).—The coast between Tandjoeng Langka and Tandjoeng Raja (Radja), about 38 miles north-northwestward, is low, with occasional rocky points and sandy beaches. Tandjoeng Pinjak (Pinyak), a point nearly 9 miles west-northwestward of Tandjoeng Langka, has a village near it. Tandjoeng Lempoejang (Lempuyang) is a rocky point about 11 miles north-northwestward of Tandjoeng Pinjak. Tandjoeng Udang, a high rocky point about $3\frac{1}{2}$ miles northward of Tandjoeng Lempoejang, is the end of a spur of the range of which Lali is the highest peak. Tandjoeng Boenga (Bunga), a projecting point about $4\frac{1}{2}$ miles north-northwestward of Tandjoeng Selinta, is conspicuous. Punai is a low, rocky islet about 1 mile northward of Tandjoeng Boenga and about 100 yards offshore. Tandjoeng Raja is a conspicuous rocky point, close westward of which is the hill, Raja. Tnadjoeng Belajar, the southeast point of the entrance to the bight in which is the roadstead Reede Soengai Liat (sec. 6-65), is about 2 miles north-northwestward of Tandjoeng Raja.

Off this entire section are numerous islets and reefs, some of them incompletely surveyed. For additional description of off-lying formations see secs. 6-56 to 6-63.

6-55 REEDE PANGKALPINANG.—A river, the Soengai Merawang (Batu Rusa), flows into the sea by way of an outlet about $2\frac{3}{4}$ miles north-northwestward of the conspicuous point Tandjoeng Boenga. Reede Pangkalpinang, the roadstead off this outlet, is the area contained within (a) the line joining Tandjoeng Raja to the center of the islet Pandjang, (b) a line drawn 56°

from the northern point of the entrance to the river, and (c) a line drawn 067° from the islet Punai. Note that the north point of the entrance to the river is marked by a small coconut plantation.

This roadstead is entirely open during both monsoons.

6-56 Islets and reefs in roadstead.—Pandjang (Panjang), an islet with a maximum dimension of 1 mile, lies nearly 8 miles southwestward of the outlet of the Soengai Merawang. The islet rises from an extensive drying reef and is covered with coconut trees.

Boedjoer (Bujur), another islet covered with coconut trees and rising from a drying reef, lies about $1\frac{1}{4}$ miles eastward of Pandjang. Boedjoer has a maximum dimension of less than $1\frac{1}{2}$ miles.

Gerek is a drying reef nearly 1 mile long in a north and south direction. Gosong is a drying reef less than $\frac{3}{4}$ mile long in a north-northeast and south-southwest direction. These two reefs are dangers within a distance of about $2\frac{1}{4}$ miles northwestward of Pandjang. The southwestern extremity of Gosong is marked by a beacon, with a red cylinder topmark.

Karang Kapal is a drying reef lying about $3\frac{3}{4}$ miles northeastward of Tandjoeng Boenga. Several reefs, with depths of only a few feet over them lie within a distance of $\frac{3}{4}$ mile northeastward and also $1\frac{1}{4}$ miles eastward of Karang Kapal. A can buoy, painted in red and yellow checkers, is moored about $\frac{3}{4}$ mile northward of Karang Kapal. This buoy is equipped with a radar reflector.

A black conical buoy with a cylindrical topmark and green reflector marks the end of a shoal off the mouth of the river, about 2 miles north-northeastward of Tandjoeng Boenga.

6-57 Anchorage.—In calm weather, between May and October, vessels with local knowledge can anchor in a position about $1\frac{1}{4}$ miles northwestward of Karang Kapal. In that vicinity depths of about 28 feet are available, over a bottom of mud. In one recommended position the northern point of the entrance to the Soengai Merawang bears 270° and the eastern extremity of the islet Pandjang bears 135° .

During the westerly monsoon, between November and April, sheltered anchorage can be taken southward of the islet Pandjang,

in a depth of about 26 feet over a bottom of mud and sand. In one recommended position the summit Pau bears 268° and the eastern extremity of the islet Pandjang bears 005° . In 1958, a vessel with a draft of 21 feet anchored at both of the above anchorages.

In early 1961, a vessel anchored in 6 fathoms about $2\frac{1}{2}$ miles northwestward of Koraal General Elliot.

Pilotage.—In early 1961, no pilot was available for Pangkalpinang.

During the easterly monsoon anchorage can be taken in the channel between the drying reefs Gerek and Gosong. In one recommended position the beacon marking the southwestern extremity of Gosong bears 290° and is about $\frac{3}{4}$ mile distant; the depth is 4 fathoms. Care must be taken to avoid a small, steep-to shoal patch, over which the depth is $2\frac{1}{4}$ fathoms, lying about 800 yards eastward of the beacon. This position is about 250 yards off the western side of Gerek.

6-58 River.—The depth on the bar across the outlet of the Soengai Merawang is about 1 foot at chart datum, but depths of 3 or more fathoms are available within the bar.

6-59 Directions.—Vessels coming from the China Sea to the northward should steer to pass about 7 miles eastward of Tandjoeng Raja, and when that point bears 270° course should be changed to southward for the light beacon on Koraal General Elliot, and thence to the anchorage.

6-60 PANGKALPINANG ($2^{\circ} 07' S.$, $106^{\circ} 07' E.$), the headquarters of a government official, is situated on the Soengai Pangkalpinang, a tributary of the Soengai Merawang.

Provisions, water and fuel oil are available.

The town is connected with the general telegraph system; there is a local telephone service. There is regular communication by steamer with other ports of Indonesia.

The town has a hospital and a harbor doctor.

Pangkal Balam is a town lying near the confluence of the Soengai Merawang and its tributary, the Soengai Pangkalpinang, or about 2 miles westward of the outlet of the Soengai Merawang.

A wharf about 150 feet long has a depth of 8 feet alongside. A $2\frac{1}{2}$ -ton crane is provided at the outer end of the wharf.

6-61 INSHORE PASSAGE FROM REEDE KOBA TO REEDE PANGKALPINANG.—A channel trending between the reefs off the northeastern coast of Bangka can be followed from Reede Koba to Reede Pangkalpinang by vessels of fairly light draft. The most useful of the various points on the coast and the mountains within the coast for fixing position have been described in sec. 6-54.

On the northeastern side of this route are a number of islets of use for position-fixing, as well as a number of dangerous reefs. Poelau Beboear (Bebuar) is a tiny islet lying about 11 miles northward of Tandjoeng Langka. This sandy islet is tree-covered, and rises from a drying reef about 2 miles in extent. Horse, a reef about 2 1/2 miles east-southeastward of Poelau Beboear, is marked by a BEACON with a red cylinder topmark. Foul ground extends as far as 3 miles northeastward from Horse. Between this foul ground and foul ground extending eastward and northeastward from Poelau Beboear is a passage, with a minimum width of about 800 yards and a least depth of 7 3/4 fathoms, sometimes used by vessels with local knowledge proceeding northward from Reede Koba. A reef patch, over which the least depth is 1 1/4 fathoms, lies about 2 1/2 miles south-southeastward of Horse. Poelau Gosong Asam, a large drying reef, lies with its east extremity nearly 3 miles northwestward of Poelau Beboear. Two islets rise from the reef. Johora, the western islet, is shrub-covered, and has a few coconut trees on its west side. Pasir, the eastern islet, resembles Poelau Beboear. The islet Poelau Ketawi, about 1 1/4 miles westward of Poelau Johora, is covered with coconut trees, and can be identified by two trees towering over the stand of coconut trees. Teali, a drying reef lies about 1 3/4 miles northwestward of Poelau Ketawi. Another drying reef lies about 1/2 mile northwestward of Teali and is marked by a BEACON with a red cylinder topmark, standing a short distance within its southern extremity.

In 1957 there were fishing stakes in the channel about 2 miles southward and southwestward of Poelau Ketawi and about 1 1/2 miles south-southwestward of Teali.

6-62 DIRECTIONS FOR INSHORE PASSAGE FROM REEDE KOBA TO REEDE PANGKALPINANG.—A northwesterly course should be steered from Reede Koba to a position about 2 1/2 miles southward of Poelau

Ketawi. A vessel approaching from Gaspar Straten can steer 287° for the peak Mangkol, passing not less than 3 miles southward of Poelau Beboear, to the position 2 1/2 miles southward of Poelau Ketawi. Thence a course of 322° toward Tandjoeng Boenga should be made good, noting that the latter point will be seen nearly in range with Kepoh, a 476-foot summit about 10 miles beyond the point. When the eastern extremity of the islet Pandjang bears 0° it should be steered for on that bearing, passing westward of the beacon marking the reef northwestward of Teali. As already mentioned (sec. 6-57), vessels can anchor southward of the islet Pandjang. To proceed to the anchorage between Gosong and Gerek, or to Reede Pangkalpinang, the 0° course should be held to a position from which the northeastern slope of Sambongiri is in range, bearing 325°, with the beacon on Gosong, which leads southwestward of Pandjang and Gerek in a least depth of 2 3/4 fathoms.

In 1958, a vessel drawing 21 feet, following the above courses, passed inside the reefs in both directions about the time of high water.

6-63 CHANNEL FROM GASPAR STRATEN TO REEDE PANGKALPINANG.—The most direct route from Gaspar Straten to Reede Pangkalpinang, according to the chart, trends generally northwestward between the reefs and islets lying off the northeast coast of Bangka toward Koraal Generaal Elliot, and thence westward and southwestward to the roadstead.

The initial course is 312° for the hill Poeak, and this course leads less than 1 mile northeastward of the foul ground extending northeastward 3 miles from beacon-marked reef Horse (sec. 6-61). Poelau Beboear and Poelau Gosong Asam, likewise previously described, are also on the southwestern side of this channel.

Scotia, a 2 3/4-fathom shoal, is on the northeastern side of the channel in a position nearly 7 miles northeastward of the beacon marking the reef Horse. Goat, a reef with a depth of 3 feet over it, is about 5 1/2 miles northward of the beacon and the same distance north-northeastward of Poelau Beboear. Also on the northeastern side of the channel is West Lombok, a patch over which the depth is 2 3/4 fathoms, which lies nearly 6 miles northwestward of Goat. Fathool Barie, a reef (continued on page 121)

patch from which rises a drying rock, lies about 2 1/2 miles north-northwestward of West Lombok.

Koraal Generaal Elliot (General Elliot Reef), a drying reef lies on the northern side of the channel in a position about 9 miles northeastward of the point Tandjoeng Boenga. This reef is near the southwestern end of a 4-mile stretch of foul ground. A light is shown from a beacon, 41 feet high and painted in red and white horizontal bands, on the southwestern side of the reef. (Light reported extinguished, 1965.)

Karang Gading, a patch of drying reef, lies on the southwestern side of the channel in a position about 2 1/2 miles southward of Koraal Generaal Elliot. Karang Miang is a drying patch on the southern side of the channel in a position about 2 miles northwestward of Karang Gading. A small reef, over which the depth is 4 feet, lies nearly midway between Karang Miang and Koraal Generaal Elliot. A 3 3/4-fathom patch lies about 1 mile southward of the light beacon. A number of shoal patches lie west-southwestward, westward, and northwestward of Koraal Generaal Elliot.

6-64 CHANNEL FROM REEDE PANG-KALPINANG TO REEDE SOENGAI LIAT.—A foul area, in which are numerous sunken rocks, lies with its southern extremity in a position about 3 3/4 miles northwestward of the light beacon on Koraal Generaal Elliot. The area is about 1 1/2 miles long in a north and south direction, and is on the western side of a channel, about 800 yards wide and swept to a depth of 30 feet, which extends from a point about 2 miles westward of Koraal Generaal Elliot Light to a point about 3 1/4 miles north-northwestward of that reef.

West Rif, over which the depth is 1 1/4 fathoms, lies in a position about 6 3/4 miles north-northeastward of the light beacon on Koraal Generaal Elliot. This reef patch is on the eastern side of the channel.

Malang Tete, a reef patch from which rise rocks visible at times from distances up to 5 miles, lies in a position about 2 1/2 miles south-southeastward of Tandjoeng Raja. Fokke is a drying reef lying nearly 1 mile northeastward of Malang Tete. These dangers are on the western side of the channel.

Pedis Selatan, a reef patch over which the depth is 1 1/4 fathoms, lies nearly 3 1/2 miles eastward of Tandjoeng Raja. Pedis Oetara, a patch with a depth of 3 fathoms over it, lies about 1 1/4 miles northward of Pedis Selatan. These dangers are on the eastern side of the channel.

Karang Timor Laoet (Karang Timur Laut), over which the least depth is 3 1/4 fathoms, lies nearly 4 1/2 miles northeastward of Tandjoeng Raja. Bronbeck, a shoal over which the least depth is 2 1/2 fathoms, lies about 1 mile west-northwestward of Karang Timor Laoet and 4 miles north-northeastward of Tandjoeng Raja. A 3 3/4-fathom patch lies about 3/4 mile southeastward of Bronbeck and about 1/2 mile southwestward of Karang Timor Laoet. These dangers are in the outer part of Reede Soengai Liat; the recommended route to that roadstead passes southwestward of them.

6-65 REEDE SOENGAI LIAT.—The northwestern coast of Bangka forms a bight between Tandjoeng Belajar (1° 52' S., 106° 10' E.), and another point, Tandjoeng Lajang, about 4 1/2 miles northwestward.

A river, the Soengai Liat, flows into this bight by way of an outlet about 1 1/2 miles south-southwestward of Tandjoeng Lajang. Reede Soengai Liat, the roadstead off this outlet, has the following limits: (a) a line drawn from Tandjoeng Lajang to Tandjoeng Belajar; (b) a line drawn in a 56° direction from the outlet; (c) a line drawn in a 112° direction from the outlet.

6-66 Marks.—Tandjoeng Belajar is a steep-to, rock-fringed, fairly conspicuous point.

Tandjoeng Lajang (Layang) is rocky, and has on it a low ridge of hills sloping to the sea. Rocks, some above and some below water, extend as far as 600 yards from the point. Lajang Heuvel, a summit 446 feet high, is about 3/4 mile westward of the point.

Toeing, a summit 817 feet high, lies on the northern side of Tandjoeng Toeing in a position about 13 1/2 miles north-northwestward of Tandjoeng Lajang.

The lights of the tin mines in the vicinity may often be seen at night from the roadstead and approaches.

6-67 Dangers.—April Rif, over which the depth is 6 feet, lies about 3/4 mile northeastward of Tandjoeng Belajar.

Karang Lajang Darat, a patch over which the depth is 2 3/4 fathoms, is about 1,200 yards southeastward of Tandjoeng Lajang.

Karang Lajang Laoet, over which the depth is 3 1/4 fathoms, is about 1 mile east-northeastward of Tandjoeng Lajang.

Karang Liat lies nearly 3 miles east-southeastward of Tandjoeng Lajang, and has on it two drying rocks.

Karang Pinakong, about 1 1/2 miles southeastward of Tandjoeng Lajang, has over it a depth of 1 1/4 fathoms. A red can buoy, surmounted by a red cylinder, is moored off the northwest side of the reef. The buoy is equipped with a radar reflector.

Karang Kapal, a reef with a depth of 2 3/4 fathoms over it, lies nearly 1 mile eastward of Karang Pinakong.

A patch of 4 1/4 fathoms lies about 3 1/4 miles eastward of Tandjoeng Lajang.

Karang Laoet (Laut), a patch over which the depth is 3 3/4 fathoms, lies nearly 4 1/2 miles east-northeastward of Tandjoeng Lajang.

6-68 Anchorage.—The usual anchorage is in a position southward of the buoy marking Karang

Pinakong and about 1 mile offshore, in a depth of 3 3/4 fathoms. In the recommended position the summit Toeing is in range, bearing about 337°, with the outer rocks off Tandjoeng Lajang. Note that there is a heavy swell during the easterly monsoon.

6-69 Directions.—Vessels bound for Reede Soengai Liat from Reede Pangkalpinang should bring Pau (Lapa Heuvel) to bear 230° astern; the 50° course thus established leads northwestward of the buoy moored about 3/4 mile northward of Karang Kapal. Vessels should pass northwestward of this buoy and continue on the original 50° course for a distance of about 1 mile. An easterly course should then be steered and the swept channel entered. A northerly course up the swept channel should be followed to its northern end, about 3 1/4 miles north-northwestward of Koraal Generaal Elliot Light, and thence a north-northwesterly course should be steered to pass westward of Pedis Selatan. Thence a northwesterly course should be steered, taking care to avoid the shoal Bronbeck, and thence toward the buoy marking Karang Pinakong. A vessel should pass northward and thence westward of the latter buoy to the anchorage southward of the buoy.

Vessels making for Reede Soengai Liat from the northward should pass not less than 2 miles eastward of Tandjoeng Lajang, because of the dangers lying off that point. When the summit Lajang Heuvel bears 270°, course should be altered for the buoy marking Karang Pinakong, passing northward and thence westward of that buoy to the anchorage.

6-70 Soengai Liat, the town, lies less than 2 miles from the entrance to the river.

There are telegraph facilities, and steamers connect the town with other ports of Indonesia. A customhouse is maintained in the town.

The services of a port physician are available.

6-71 NORTHEASTERN COAST OF BANGKA (*continued*).—From Tandjoeng Lajang the

northeast coast of Bangka trends irregularly about 23 miles northwestward to Tandjoeng Samak, the northeastern extremity of the island. A number of rivers flow into the sea through this section.

6-72 Tandjoeng Lajang to Tandjoeng Katjoer.—Tandjoeng Katjoer (Kachur) is about 6 3/4 miles northwestward of Tandjoeng Lajang. The beach between the two points is sandy, and is backed by trees; Tandjoeng Batoe (Batu), a point about midway, is rocky, and is fringed by reef from which rise several rocks, some of which are covered with high trees. Tandjoeng Katjoer is low and sandy, and from the point a sandy spit, with a reef at its outer end, extends about 1 mile northeastward. Poelau Simbang is a small islet rising from a reef patch close off the outer end of the spit. A drying patch of reef lies about 1 1/2 miles eastward of Tandjoeng Katjoer.

6-73 Tandjoeng Katjoer to Tandjoeng Pakoe.—Tandjoeng Toeing is about 6 miles northward of Tandjoeng Katjoer, and the coast between these points forms a shallow bay. Tandjoeng Toeing (Tuing) is high and rocky, and close off its northern side is a hill, Toeing, which is 817 feet high. Ponggoel is the largest of a number of above-water rocks lying off the point.

Tandjoeng Pakoe (Paku) is about 6 miles northwestward of Tandjoeng Toeing. This section of coast is high and rocky, with here and there an oc-

casional sandy beach. A useful mark for Tandjoeng Pakoe is Poelau Pakoe, a small islet close off the point.

6-74 Tandjoeng Pakoe to Tandjoeng Samak.—Tandjoeng Samak (Grasak) is about 5 miles northwestward of Tandjoeng Pakoe. The coast between these points forms a bay with a sandy beach through which flow three small streams. A reef, over which the depth is 1 fathom, lies about 2 miles northward of Tandjoeng Pakoe; a reef, over which the depth is 1 1/4 fathoms, lies about 3 miles northwestward of the point.

6-75 Outlying reefs.—Iwan ($1^{\circ}40' S.$, $106^{\circ}18' E.$) lies about 15 miles east-southeastward of Tandjoeng Toeing, and has over it a depth of $1\frac{1}{4}$ fathoms. The Bangka coast can generally be seen from positions near this steep-to reef.

A 16-foot shoal exists about $3\frac{3}{4}$ miles southeastward of Iwan.

Discolored water was reported (1954) to have been seen about $2\frac{1}{2}$ miles south-southeastward of the 16-foot shoal.

An obstruction was reported in 1954 about $6\frac{1}{4}$ miles southeastward of Iwan.

Severn, a steep-to reef patch with a depth of $1\frac{3}{4}$ fathoms over it, lies about 27 miles eastward of Tandjoeng Toeing. Sounding gives no warning of approach to this reef. With good visibility the highest hill on Tandjoeng Toeing is generally visible, as well as Raja, the hill on Tandjoeng Raja.

CHAPTER 7

STRAAT KARIMATA

7-1 BILLITON (Belitung), an island with a maximum length of about 47 miles and roughly circular in shape, forms the principal part of the western side of Straat Karimata.

The island is wooded and rather flat; although there are a number of scattered hills there are no mountain ranges. The northern coast is generally higher and rockier than the eastern and southeastern coasts. The island is thinly populated, except at a number of tin-mining plants on the island, where several thousand imported laborers are to be found. The ore is shipped in lighters or small launches to Reede Tandjoeng Pandan.

A number of good motor roads are available on Billiton; an island telegraph system is maintained, and there are post offices in practically all villages.

7-2 **Landmarks.**—Between Tandjoeng Genting, the southwestern extremity of Billiton, and Telok Balok, a bay indenting the middle of the southern coast of the island, the mountains lie close to the coast. Eastward of the bay, however, the land near the coast is low, and only two hills, both inland, can be seen.

The summits northeastward of Tandjoeng Genting attain elevations of over 1,000 feet, but are not often seen from vessels passing southward of Witte Rots. In positions westward of Poelau Kebatoe vessels headed for Discovery Oostbank will sometimes sight only Goenoeng Loedai (sec. 6-29) in clear weather in the westerly monsoon.

The elevations westward of Telok Balok and the mountains farther inland are good landmarks in positions near Poelau Ketaboe. Goenoeng Tadjembini (Tajem Bini), 1,650 feet high, and Goenoeng Tajemlaki (Tajem Laki), 1,663 feet high, are the highest summits of Billiton, and stand in approximately the center of the island. Both have sharp peaks.

The elevations eastward of Telok Balok include Goenoeng Tioeng, a detached conical peak, 630 feet high, in a position about 10 miles northward of Tandjoeng Batoe Itam, the southeasternmost point of Billiton, and also Goenoeng Mengaroen (Mengarun), a peak 778 feet high, in a position nearly 4 miles west-northwestward of Goenoeng Tioeng. Goenoeng Mengaroen is flatter than Goenoeng Tioeng, and consists of three small ridges standing close to one another.

7-3 **Tidal currents.**—The horizontal movement of the water off the coasts of Billiton is a diurnal tidal current. In the fairway of Straat Karimata there is a drift current. In the narrow passages between islets and reefs the tidal currents may attain rates of 2 to 3 knots.

Off the southern coast of Billiton the tidal currents set westward and eastward to southeastward; off the eastern coast they set northward to north-northwestward and southward to southeastward; off the northeastern coast they set northwestward and southeastward; off the northern coast they set westward to west-northwestward and eastward to southeastward.

7-4 **SOUTHERN COAST OF BILLITON.**—From Tandjoeng Genting ($3^{\circ}15'S.$, $107^{\circ}37'E.$), the southwestern extremity of Billiton, the southern coast of the island trends eastward about $1\frac{3}{4}$ miles to Tandjoeng Batoe Toengkoe. The latter point and Tandjoeng Batoe Penjoe, about $1\frac{1}{4}$ miles farther northeastward, are both rocky. A narrow drying reef, on which are numerous rocks above water, fringes this section of coast. This drying reef fringe continues to Tandjoeng Roesah, a point nearly $11\frac{1}{2}$ miles east-northeastward of Tandjoeng Batoe Penjoe.

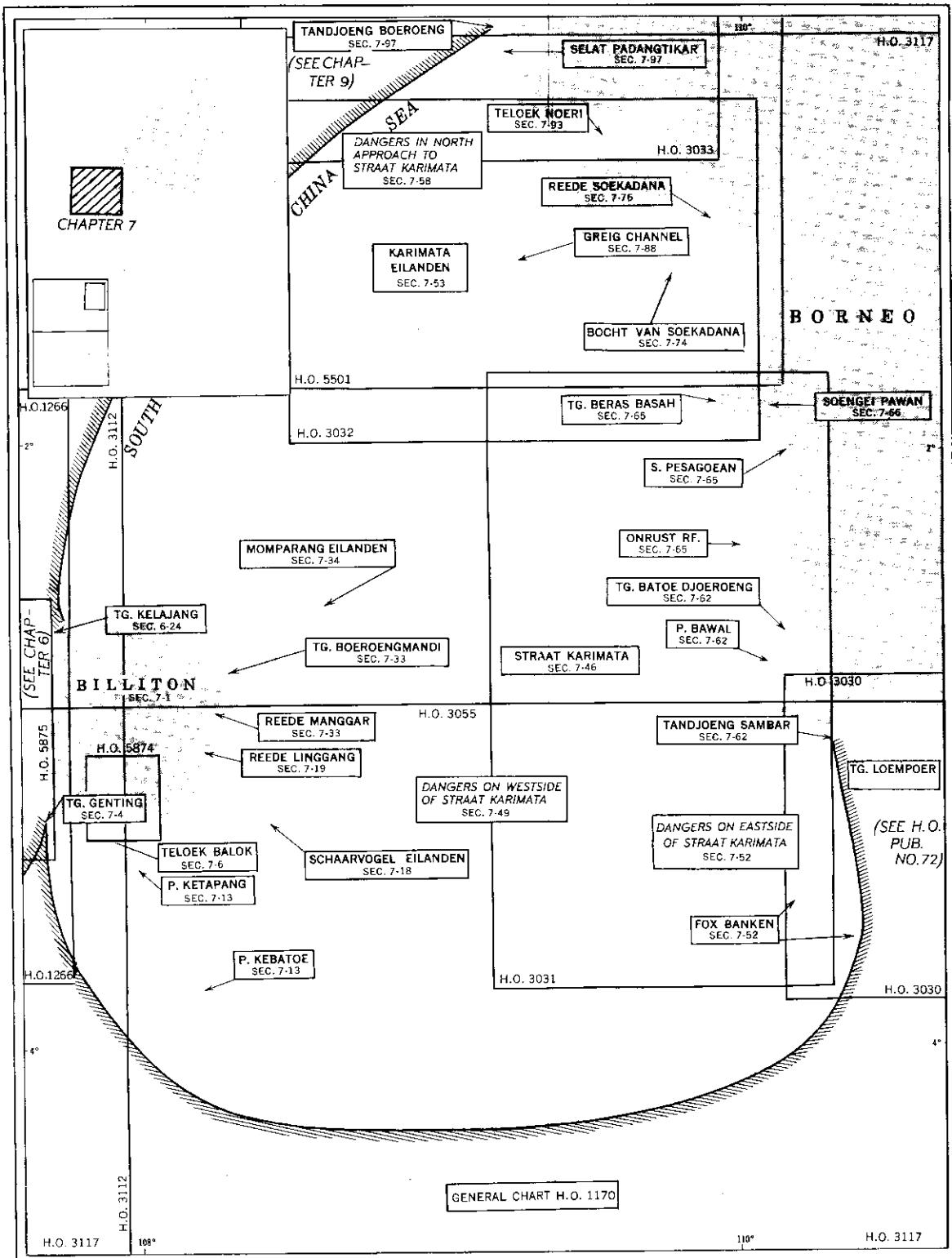


Chart limits shown are of the best scale charts issued to naval vessels by the U.S. Navy Hydrographic Office.
Section numbers refer to the place in the text where a description of the designated locality begins.

CHAPTER 7—GRAPHIC INDEX

• H. O. 71

7-5 Off-lying islets and dangers.—The Masar Eilandens consist of four thickly wooded islets visible nearly 12 miles. Poelau Kennedy, the largest of the four, is about 8 miles southeastward of Tandjoeng Genting, and has a fringe of reef that attains a maximum width of nearly 1/2 mile off its southeastern side. Poelau Oetan (Otan), an islet about 1 1/2 miles east-southeastward of Poelau Kennedy, is also surrounded by reef; a small islet stands near the outer edge of the reef on the western side of the islet. The eastern end of Poelau Oetan is a fairly high, bare ridge of rock. The fourth islet of the Masar Eilandens is about 1 mile northwestward of Poelau Kennedy. A detached reef, over which the depth is 3 feet, lies close northeastward of Poelau Kennedy.

Poelau Belatoek (Belatuk) (Blotock), a small islet about 1 1/4 miles southeastward of Tandjoeng Batoe Penjoe, lies with another islet, Gosong Mentigi, on the western part of a large drying reef. Roempoet, a small islet, lies nearly 4 miles eastward of Tandjoeng Batoe Penjoe. A reef, over which the depth is 2 feet, lies nearly 2 miles southward of Poelau Belatoek. Ketopai (Ketupai), about 4 miles southeastward of Poelau Belatoek, and Poelau Keramiah (Kramiah) (Kramia), about 2 1/4 miles northeastward of Ketopai, are small, reef-fringed islets.

7-6 TELOEK BALOK (Balok Baai).—This bay is entered between Poelau Keramiah on the western side and Tandjoeng Kloempang (Keloempang) (Kelumpang) on the eastern side. The latter point is nearly 13 1/2 miles eastward of Poelau Keramiah and is low, rocky, and covered with high trees. The bay indents the southern coast of Billiton to a distance of about 12 miles in a northerly direction from the line joining the entrance points. The head of the bay is shallow, and there is a considerable number of reefs, some of which dry, in the bay. Some of the reefs are marked by privately maintained beacons.

Teloek Balok is considered accessible only to vessels of light draft and with local knowledge.

7-7 Shores—Islets.—Oempang (Umpang) ($3^{\circ}17'S.$, $107^{\circ}52'E.$), is a small islet in the entrance to Teloek Balok in a position nearly 7 1/4 miles westward of Tandjoeng Kloempang. A number of reefs lie within distances of 2 miles northeastward, 1 1/4 miles westward and north-northwestward, and 2 1/4 miles southwestward of Oempang.

Tandjoeng Roesah is a point on the western shore of Teloek Balok in a position about 7 miles northeastward of Poelau Keramiah.

Beroempoet is a very small islet in the eastern portion of the bay in a position about 5 miles east-southeastward of Tandjoeng Roesah. A hill on the eastern shore of the bay in a position about 9 miles northward of Tandjoeng Kloempang forms a useful range with Beroempoet.

Poelau Kampak is a relatively large island toward the head of Teloek Balok. Beacon "A" stands on a reef patch close eastward of Poelau Kampak. Tandjoeng Rising is a point on the eastern shore of the bay opposite Poelau Kampak.

7-8 Entrance channels—Dragged areas.—Northwestward of Oempang is a channel leading between the dangers around Oempang and the dangers extending southward from Tandjoeng Roesah. This channel is about 1 1/4 miles wide over depths dragged to 4 1/4 fathoms. Beroempoet in range, bearing $48^{\circ}1/2'$, with the hill within the eastern shore of the bay leads through this dragged channel.

Northeastward of Oempang is a channel leading between the dangers in that vicinity and the dangers extending westward from Tandjoeng Kloempang. This channel is dragged to a depth of 4 fathoms over a width of about 1 3/8 miles except where it narrows to a width of about 3/4 mile, northeastward of Oempang. A peak and a conspicuous tree standing northwestward of Tandjoeng Roesah in range, bearing 326° , lead through this channel.

These two channels converge in a rather extensive area, dragged to depths of 4 1/4 fathoms, lying about 2 miles northward of Oempang. Thence a narrow channel with graduated dragged depths

of 3 3/4 fathoms, 3 fathoms, 2 1/4 fathoms, 1 3/4 fathoms, and 1 1/4 fathoms leads about 7 miles northward to a position abreast Tandjoeng Rising. Beacon "A" bearing 0° leads up this channel.

Between Beacon "A" and Tandjoeng Rising is a small basin in which are depths of 3 1/4 fathoms. The surrounding depths are 2 1/4 fathoms or less. Anchorage can be taken in this basin.

7-9 **Anchorage** can be taken off the village on Tandjoeng Roesah, in an area dragged to a depth of 2 3/4 fathoms. To take up anchorage there the 0° for Beacon "A" should be left when Beroempoet bears 106 1/2°. The latter bearing should be held astern until the eastern side of Poelau Kampak bears 2°, when anchorage can be taken.

7-10 **Directions.**—The bay can be entered from the southwestward by steering 48 1/2° with Beroempoet in range with the hill within the eastern shore of the bay. This range should be followed to a position from which the conspicuous tree northwestward of Tandjoeng Roesah bears 330°; course should then be altered northward and Beacon "A" steered for bearing 0°. This course should be held to a position from which the southwestern shore of Poelau Kampak bears 317°, the northeastern side 348 1/2°, and Tandjoeng Rising bears 19 1/2°. Course can then be shaped to the anchorage in the basin between Poelau Kampak and Tandjoeng Rising. In following these directions it should be noted that Beroempoet is at times indistinct against the background.

Vessels entering Teloek Balok from the eastward or southeastward should steer 326° with the peak and conspicuous tree previously mentioned in range. This course should be held to a position from which Beroempoet bears 58 1/2°, thence course can be changed to 0° for Beacon "A" as previously described.

7-11 **Deadang (Dindang) (3°05'S., 107°53'E.)**, the settlement on the eastern shore near the head of Teloek Balok, is of some local importance as the capital of the district. The settlement is connected by road with the principal towns of Billiton.

7-12 **SOUTHERN COAST OF BILLITON (continued).**—The coast between Tandjoeng

Kloempang and Tandjoeng Batoe Itam (Hitam), a low, rocky point nearly 6 miles east-northeastward, is low and densely wooded. Some islets and rocks lie on the coastal reef, which extends from the coast as far as 1/2 mile and dries. A number of rocks above water lie within a distance of 1 mile southeastward and 1 1/2 miles east-southeastward of Tandjoeng Kloempang. Boesoeng Lantai, a detached drying reef, lies nearly midway between this point and Tandjoeng Batoe Itam and nearly 1/2 mile offshore. Some small islets or rocks lie close off Tandjoeng Batoe Itam; a reef, over which the depth is 2 feet, lies about 1/2 mile southeastward of the point.

7-13 **Islet and dangers southward of Billiton.**—Poelau Kebatoe (3°48'S., 108°04'E.), a small, rocky islet about 31 miles southward of Tandjoeng Kloempang, attains a height of 344 feet. The islet has a conical shape and is marked here and there by stunted trees; it is said to be visible in clear weather from distances up to 24 miles. It is steep-to except at its northwestern side, off which a reef, on which are a number of rocks above water, extends as far as 400 yards. The islet is known locally as Tjina Pebatoen, or "seated Chinaman," from its appearance, and it is considered a good mark for vessels approaching either Gaspar Straten or Straat Karimata.

Witte Rots (Witte Rocks) (White Islet) is a grayish-white rock formation lying about 1 mile southwestward of Poelau Kebatoe. The formation attains a height of 57 feet; it was discovered in 1931, and it is thought that other rocks may be present in the vicinity. Zephyr Rif lies about 1 mile westward of Poelau Kebatoe, and has on it some drying rocks. A reef about 1/2 mile northeastward of Witte Rots has over it a depth of 1 foot, and is marked by a brown discolored and also by surf when there is any swell.

Grace Riffen lie north-northeastward of Poelau Kebatoe. The southwestern portion of Grace Riffen is nearly 4 miles from Poelau Kebatoe; the northeastern portion, Karang Kawat, is about 2

miles farther north-northeastward. The southwestern portion is awash at low water; the northeastern portion has on it a number of drying rocks. Both portions are steep-to, and at high water are marked by surf or tide rips. In clear weather Goenoeng Loedai (sec. 6-29) on Billiton is just visible over the horizon from positions near Grace Riffen.

Poelau Ketapang, a low islet lying about 8 1/2 miles southward of Tandjoeng Kloempang, is swampy and wooded and has two rocks lying on the northern side of the reef which surrounds the islet.

7-14 EASTERN COAST OF BILLITON
(*H. O. Chart 3117*).—The eastern coast of Billiton, the coast fronting Straat Karimata, has off it islands, islets, reefs, and dangers so numerous that ocean-going vessels should not be taken westward or southward of the lines joining Discovery Oostbank, Catherine Rif, Ontario Rif, and Florence Adelaide. (See dashed lines on *H. O. Chart 3117*.)

Passages lead between the islands, islets, and reefs mentioned in the preceding paragraph to Linggang and Manggar, but it is important to remember that these passages should not be attempted without local knowledge.

7-15 Pilots.—Pilots for these passages can be obtained at Tandjoeng Pandan. These pilots are native fishermen, and are said to be exceptionally clever and quick in detecting reefs and dangers, but only under the coast with which they are well acquainted.

7-16 Tandjoeng Batoe Itam to Tandjoeng Samak.—The coast trends irregularly north-northeastward from Tandjoeng Batoe Itam (sec. 7-12) to Tandjoeng Samak, a distance of about 25 miles. This section is low.

Tandjoeng Batoe Boejong, a point about 2 miles northward of Tandjoeng Batoe Itam, is the southern point of the entrance to a bay almost entirely filled by reefs extending from its shores. Serokat Besar is an islet about 3 miles northeastward of Tandjoeng Batoe Boejong and about 600 yards off the approximate northeastern point of the en-

trance to the bay. During the westerly monsoon good **anchorage** can be taken in a position about 1 1/2 miles southward of the islet. The depth in this position, which can be approached easily from the southward, is 5 fathoms, and the bottom is mud.

Tandjoeng Tapok ($3^{\circ}09' S.$, $108^{\circ}13' E.$, *H. O. Chart 3117*) is a point nearly 9 1/2 miles northeastward of Tandjoeng Batoe Itam. A chain of islands and reefs extends about 5 miles southward from Tandjoeng Tapok. Poelau Tepi and Poelau Pandjang are the two southernmost islets of this chain.

Useful marks along this section include Goenoeng Tioeng, a summit about 10 miles west-northwestward of Tandjoeng Tapok; another summit, Goenoeng Seloemar (Sloemar), lies about 6 1/2 miles west-southwestward of Tandjoeng Samak; Goenoeng Bolong (Boleng) is a summit nearly 9 miles north-northwestward of Goenoeng Seloemar. All these summits appear as isolated cones.

7-17 Off-lying islands and dangers.—Poelau Rotan is an islet, about 1 mile in diameter, lying about 4 miles eastward of Poelau Tepi. The channel between these two islets has near its center line a shoal, over which the depths are less than 5 fathoms, from which rise a number of rocks, some above water. A reef patch, over which the depth is 3 feet, lies nearly 2 miles south-southwestward of Poelau Rotan, and numerous reefs extend as far as 2 1/4 miles southeastward from the islet.

7-18 The Schaarvogel Eilanden occupy an area approximately 8 miles in diameter centered in a position ($3^{\circ}17' S.$, $108^{\circ}25' E.$, *H. O. Chart No. 3117*) about 20 miles eastward of Tandjoeng Batoe Itam. The group consists of seven relatively large islets and a few small islets. They are all low and thickly wooded, and between them are numerous reefs and sand banks. The reefs are steep-to, and as sounding gives no warning of approach to them, navigation through the channels between the islets demands extreme caution.

Poelau Ajer Masin, the northwesternmost islet of the group, has a conspicuous tree in its middle

part said to be visible 18 miles in clear weather. The channel between this islet and Poelau Rotan, about 6 miles west-northwestward, should not be entered because of reefs in the southern entrance.

Poelau Peneroes is the islet nearest the middle of the group, and Poelau Pengapit is the south-eastermost. The depths in the channel between the two islets are more than 16 fathoms, but coral patches and detached rocks lie on either side of the fairway. These dangers are, however, ordinarily marked by discoloration. Poelau Marai is an islet lying close northwestward of Poelau Peneroes. A shoal, with a depth of 3/4 fathom over it, lies about 1 1/2 miles north-northeastward of the northern extremity of Poelau Peneroes. The channel between Poelau Marai and Poelau Peneroes is not as wide as the channel between Poelau Peneroes and Poelau Pengapit but the fairway appears deep and clear. In connection with these channels it should be remembered that the tidal currents are strong, and that there is little shelter in either monsoon.

Poelau Beloepoet, Poelau Loeng, and Poelau Pengapit Loeng, the three eastern islets of the Schaarvogel Eilanden, lie close together. Poelau Beloepoet is the highest of these, and is a useful mark when seen from the eastward, when it appears as a hump. The outermost of several dangers extending southward from Poelau Pengapit is a drying rock lying about 4 miles from that islet.

Bower Rif is a small steep-to coral reef, with a depth of 1 1/2 fathoms over it, lying about 13 miles southeastward of Poelau Pengapit. This danger is never marked by discoloration, but there are eddies at times over it. It is nearly in the middle of a narrow ridge of sand, over which the depths are 7 to 11 fathoms, about 13 miles long in a north and south direction.

The Osterly Riffen lie northward of Bower Rif and eastward of the Schaarvogel Eilanden. Zuid Rif, the southernmost of these dangers, is about 6 miles northward of Bower Rif, and is a coral reef on which are a few patches of sand just above water. Oost Rif, nearly 2 miles northeastward of Zuid Rif, has on it some drying rocks. Noord Rif

is a patch that nearly dries lying about 3 miles northward of Oost Rif, and is often marked by breakers and tide rips. A patch of 3 3/4 fathoms lies about 2 1/2 miles westward of Noord Rif, and about 2 miles farther westward is a reef over which the depth is 5 feet. The diurnal tidal currents set northwestward and also south-southeastward to east-southeastward among the Osterly Riffen. It was found during the survey that there was a very slight current setting northwestward in November, and in December there was a constant drift current setting south-southeastward, only occasionally diminishing in force.

The Protet Riffen are two steep-to coral patches. Oost Rif, the eastern patch, is nearly 14 miles north-northeastward of Poelau Ajer Masin, and has over it a depth of 5 feet. This steep-to patch generally breaks. Strong ripples have been observed in positions 2 miles east-northeastward of Oost Rif, but no dangers have been discovered although the depths change abruptly from 12 fathoms to 20 fathoms. West Rif, the western patch, has over it a depth of 1 3/4 fathoms; it lies 2 1/2 miles west-northwestward of Oost Rif.

Within the triangular area bounded by lines connecting Poelau Rotan, the Protet Riffen, and Bower Rif there are numerous dangers in addition to those already described, as shown on the chart. On the various ridges of sand are scattered rocks and small coral patches. Some of them are just above water. Reliable landmarks can be seen only in clear weather, and even then are difficult to identify. Moreover, the tidal currents are strong, and the water is usually so troubled that the bottom cannot be seen at a depth of 2 fathoms. This entire area should, therefore, be avoided except in case of necessity.

7-19 REEDE LINGGANG (H. O. Chart 3117) is the roadstead off the entrance to the Soengai Linggang. This river, commercially the most important on the eastern coast of Billiton, flows out about 7 miles northward of Tandjoeng Tapok.

7-20 Islets and dangers in roadstead and approaches.—Tandjoeng Batoe Itam and Tand-

joeng Tapok, points on the Billiton coast in the approach to Reede Linggang from the southward, have been previously described, as have the islets Poelau Tepi and Poelau Pandjang. Poelau Tapok is an islet close off Tandjoeng Tapok.

Poleau Sekapar ($3^{\circ} 09' S.$, $108^{\circ} 15' E.$), is a small islet about $2 \frac{1}{2}$ miles eastward of Tandjoeng Tapok. Poelau Selandoe, the largest island in this vicinity, is about $2 \frac{1}{2}$ miles long in a northeast and southwest direction. It lies with its northwestern shore about $2 \frac{1}{4}$ miles southeastward of the entrance to the Soengai Linggang. The island is hilly, and is connected to the shore southward of the river entrance by a drying reef.

Poelau Meleidang (Melidang), an islet about $\frac{3}{4}$ mile long in a north and south direction, lies with its western shore about $1 \frac{1}{2}$ miles east-southeastward of Poelau Selandoe. It is a useful mark for avoiding the dangers northward of the Schaarvogel Eilanden. From the eastward it appears as a rugged ridge of hills with the highest part near the northern end of the islet. This highest part is said to be visible 20 miles in clear weather. There are several reefs southward and southwestward of the islet.

Ajam Besar and Ajam Kechil are small islets in the channel between Poelau Selandoe and Poelau Meleidang. The fairway to Reede Linggang passes between these islets and Poelau Meleidang.

Poelau Soekeon is a small islet in the northern part of the roadstead in a position nearly 2 miles northward of the northeastern extremity of Poelau Selandoe.

7-21 LANDMARKS.—In addition to the ridge of hills on Poelau Meleidang, the summits Goenoeng Tioeng and Goenoeng Seloemar on Billiton are useful marks. The conspicuous trees on Poelau Ajar Masin are also marks in this vicinity.

Goenoeng Boeroengmandi (Boeroeng Mandi), mentioned in the directions for Reede Linggang, is a conspicuous peak on the coast in a position about 17 miles northward of the entrance to the Soengai Linggang.

7-22 RIVER.—The Soengai Linggang has scoured a channel for itself through the reef

fringing the coast near the outlet. A bar across this outlet has over it a least depth of 4 feet, but inside the depths increase to 6 or more feet. The channel through the reef fringe and the river itself as far as Gantoeng, the capital of the district lying nearly 6 miles upriver from the entrance, is marked by beacons privately maintained. However, the river is navigable only by small vessels, drawing 6 feet, after half flood tide.

7-23 ANCHORAGE.—Anchorage can be taken northward of Poelau Selandoe in depths of $2 \frac{1}{4}$ to $3 \frac{1}{4}$ fathoms.

7-24 DIRECTIONS.—It is not advisable to approach Reede Linggang from the eastward because of reefs and other dangers difficult to detect. The roadstead is therefore approached from the southward by way of an inner passage marked by beacons maintained by the company engaged in mining tin.

Approach this passage by steering 0° for the eastern extremity of Poelau Tepi. When the western extremity of Poelau Sekapar bears 21° , which it will in a position about $1 \frac{1}{2}$ miles southward of Poelau Tepi, steer a course of 21° to pass eastward of Poelau Tepi and Poelau Pandjang. When Tandjoeng Batoe Itam is in range, bearing about 249° , with the northern extremity of Poelau Pandjang, steer 69° , with this range astern, to a position from which the western extremity of Poelau Selandoe bears about 352° and is just open eastward of Poelau Sekapar. Thence steer 7° to pass between Poelau Sekapar and the reef lying about $1 \frac{1}{2}$ miles eastward of it. Note, however, that this 7° course leads close to a reef, over which the depth is 2 feet, lying nearly 1 mile south-southeastward of Poelau Sekapar. When the southern extremity of Poelau Tapok is in range, bearing about 261° , with the northern shore of Poelau Sekapar, steer 028° for the east extremity of Poelau Meleidang. From a position about 1 mile southward of Poelau Meleidang, a course of 349° with the eastern side of Poelau Soekeon in range with Goenoeng Boeroengmandi leads between Ajam Besar and Ajam Kechil to westward and Poelau Meleidang to eastward. When the northern

end of Poelau Selandoe bears 270° change course to 296° for the anchorage area northward of that island.

7-25 REEDE LINGGANG TO REEDE MANGGAR.—The coast trends about 10 miles north-northeastward from the entrance to the Soengai Linggang to Tandjoeng Samak, a point marked by a small hill. A white power station on the northern slope of this hill is a useful mark; the electric lights of a tin-mining settlement on the hill are visible at a distance of 20 miles.

Vessels passing along this section should not approach Tandjoeng Samak closer than 10 miles because of numerous dangers within that distance.

7-26 REEDE MANGGAR.—Reede Manggar is the roadstead off the entrance to the Soengai Manggar, a river flowing into the sea through a channel about 2 1/4 miles north-northeastward of Tandjoeng Samak.

Anchorage can be taken in the roadstead in depths of 3 1/4 fathoms, but local knowledge is necessary both in approaching the roadstead and in taking up the anchorage.

7-27 OFF-LYING ISLETS AND DANGERS.—Numerous coral reefs and sand ridges extend southeastward from Reede Manggar to within 3 miles of the Protet Riffen. The coast for a distance of 5 1/2 miles northward of the new outlet of the Soengai Manggar is fronted by reefs to distances of 1 to 3 miles offshore; attempts to reach Reede Manggar from the eastward would be extremely dangerous and should not be undertaken.

Poelau Boekoelimau, a low, tree-covered islet about 8 miles northeastward of Tandjoeng Samak, is said to be visible 15 miles in clear weather. Poelau Siadoeng, an islet also low and thickly wooded, is about 1 mile northeastward of Poelau Boekoelimau. Passage through the channel between these two islets should not be attempted.

Busung Madau (Poelau Boesoeng Madau) is a bank about 3 miles northwest of Poelau Siadoeng. A reef with a depth of 5 feet over it, lies about 1 1/2 miles northwest of Busung Madau. A red can buoy, with a red cylinder topmark, is moored about 1/2 mile west-northwest of the reef.

Poelau Boesoeng Djong, a sand cay visible 4 miles, lies in the approach to Reede Manggar from the southward in a position about 6 miles southeastward of Tandjoeng Samak.

7-28 ANCHORAGE.—Vessels with local knowledge can anchor, in depths of 3 1/4 fathoms, in a position nearly 1 1/2 miles north-northeastward of the new outlet of the Soengai Manggar.

7-29 PIER—MOORING BUOYS.—An oil pier, with a depth of 29 feet at its head, extends from the coast in a position about 3/4 mile northeastward of Tandjoeng Samak. Vessels cannot, however, lie alongside this pier during the height of the southeasterly monsoon.

Mooring buoys are located off the head of the pier.

The pier is approached by way of a channel trending nearly parallel to the coast and entered from the northward. A depth of about 16 feet is available in this channel. The channel, entered about 7 miles north-northeast of Tandjoeng Samak, is marked by buoys that are shifted occasionally to permit dredging.

A private drydock, capable of handling craft up to 213 feet in length, is maintained at Manggar.

7-30 PILOT.—The pilot meets vessels about 6 1/2 miles north-northeastward of Tandjoeng Samak. Requests for the pilot, stating time of arrival, should be made to "Constanno Tandjung Pandan".

7-31 River.—The south mouth of the Soengai Manggar has been dredged to a depth of 10 feet, and coastal vessels can enter the river and berth at a quay about 150 feet in length. Large vessels unload at Tandjoeng Pandan (sec. 6-34).

Praus can navigate about 3 miles upriver to Manggar, the capital of the district. A small hospital and a doctor are available. The old natural outlet of the Soengai Manggar is located about $8\frac{1}{2}$ miles northward of Tandjoeng Samak.

7-32 Directions.—Directions are given for a coastwise passage from Reede Linggang to Reede Manggar, and not from seaward to Reede Manggar. Local knowledge is necessary, as a number of new dangers are being discovered from time to time in this area.

From the anchorage northward of Poelau Selandoe steer an east-southeasterly course to pass southward of a reef lying nearly 3 miles eastward of Poelau Soekoen, taking care to avoid a 1-fathom shoal lying about 2 miles east-southeastward of that islet. After passing the reef 3 miles eastward of Poelau Soekoen and at a position about 2 miles east of the north extremity of Melidang, alter course to 030° and proceed to a position in which the northern extremity of Poelau Soekoen is in range, bearing 238° , with Poelau Boesoeng Djong. Thence steer 058° , keeping the 238° range astern, which leads in a least depth of 5 fathoms between the outer reefs extending southeastward from Reede Manggar, but passes close northwestward of a $2\frac{3}{4}$ -fathom patch about $4\frac{1}{2}$ miles northeastward of Poelau Boesoeng Djong. The effect of the tidal currents, which set northward and southward across the reefs, must be considered in this vicinity. When the western extremity of Poelau Boekoelima bears 342° , alter course to 322° to pass westward of a shrub-covered sand cay having three coconut trees in its middle part and lying nearly 2 miles south-southwestward of Poelau Boekoelima. When the south point of Poelau Boekoelima bears 065° course may be altered toward Busung Nadau, near which a pilot may be embarked. A buoied channel leads from this vicinity to Reede Manggar.

7-33 REEDE MANGGAR TO TANDJOENG BOEROENGMANDI.—The eastern coast of Billiton trends about $5\frac{1}{4}$ miles generally north-northwestward from the new outlet of Soengai Manggar to Tandjoeng Boeroengmandi (Boeroeng Mandi), the northeastern extremity of Billiton.

Tandjoeng Batoe Boerok, 4 miles north-northwestward of the new outlet of the Soengai Manggar, is a rocky point.

Tandjoeng Boeroengmandi, about $1\frac{1}{2}$ miles north-northwestward of Tandjoeng Batoe Boerok, is a high, rocky point marked by Menang, a conspicuous hill, 607 feet high, just within the point. The hill appears flattened when seen from the northward and is considerably lower than Gocenoeng Boeroengmandi (Boeroeng Mandi), a conspicuous peak, 1,411 feet high, about 2 miles westward of Tandjoeng Boeroengmandi.

Shoals.—A detached shoal lies about $3\frac{1}{2}$ miles eastward of Tanjoeng Batoe Boerok (Burok).

A rocky reef, marked by a beacon, lies about $1\frac{1}{2}$ miles southeastward of the point.

A beacon marks a shoal about 1 mile eastward of the same point.

7-34 MOMPARIANG EILANDEN.—This group of small islands, sand banks, and coral reefs lies generally northeastward of Tandjoeng Boeroengmandi, the northeastern extremity of Billiton. The group occupies an area nearly 40 miles wide in an east and west direction. The islands are uninhabited, but are visited by fishermen from Billiton from time to time.

The Momparang Eiland lie westward and southward of the lines joining Discovery Oostbank, Catherine Rif, Ontario Rif, and Florence Adelaide, and as navigation westward and southward of these lines by ocean-going vessels is not recommended (see "caution" note and dashed lines on H. O. Chart 3117), no detailed description of the group is undertaken in this publication. However, small vessels can proceed through a number of channels between the various islets and dangers in the group in case of necessity, and these channels are therefore described.

7-35 Channel between Poelau Maranai and Poelau Telegapahat.—One channel trends generally northwestward through about the middle of the Momparang Eilanden.

On the southwestern side of the channel are Poelau Maranai and Hydrograaf Rif. Poelau Maranai ($2^{\circ}38'S.$, $108^{\circ}30'E.$) is a thickly wooded, somewhat hilly islet, about $\frac{1}{2}$ mile long in a northwest and southeast direction, and nearly 350 yards wide. Goesoeng Baroe is a sand cay, nearly 1 mile eastward of Poelau Maranai, on which are a few trees. Poelau Maranai can be distinguished at a distance of 14 miles. Hydrograaf Rif, about $4\frac{1}{2}$ miles northwest of Poelau Maranai, has over it a depth of 2 fathoms. Also on the southwestern side of the channel is a shoal patch, over which the depth is $2\frac{1}{4}$ fathoms, lying nearly $4\frac{1}{2}$ miles north-northwestward of Poelau Maranai, and about $2\frac{1}{4}$ miles east-northeastward of Hydrograaf Rif.

On the northeastern side of the channel are Poelau Telegapahat, Poelau Nangka, and Coreyra Rif. Poelau Telegapahat, about 5 miles northeastward of Poelau Maranai, is low except for two rocky hillocks near its southern end; the islet is about 1 mile long in a north and south direction, and about $1\frac{1}{2}$ mile wide. Fishermen visit this islet for water. Njamoeck and Sekoempoel are small islets within a distance of $1\frac{1}{2}$ miles northward of the northern extremity of Poelau Telegapahat. All three islets are thickly wooded, and are visible at a distance of 12 miles. A reef, over which the depth is 3 feet, lies about 2 miles westward of Poelau Telegapahat; the channel passes southwestward of this reef. Poelau Nangka, the northernmost island on the northeastern side of the channel, is about 4 miles north-northwestward of Poelau Telegapahat; it is the only high island of the Momparang Eilanden, and measures nearly $1\frac{1}{2}$ miles long in a north and south direction and somewhat less than a mile in an east and west direction. A summit near the southern extremity of Poelau Nangka is 590 feet high; this summit is said to be visible 32 miles in clear weather, and is higher and steeper than a summit near the northern end of the island. These two summits cause Poelau Nangka to appear as two

detached islets when seen from any distance from eastward of westward. Sembilan, a small islet which lies about $\frac{1}{2}$ mile westward of the south point of Poelau Nangka, has been reported (1958) to be a good radar target at a distance of 15 miles. Coreyra Rif, a reef over which the least depth is $1\frac{1}{2}$ fathoms, lies nearly $3\frac{1}{2}$ miles westward of the southern extremity of Poelau Nangka.

The **directions** for this channel are: from southward steer to pass about midway between Poelau Maranai and Poelau Telegapahat on a 302° course, and when Poelau Maranai bears 180° change course slightly more northward to pass between the $2\frac{3}{4}$ -fathom shoal about $4\frac{1}{2}$ miles north-northwestward of Poelau Maranai and Coreyra Rif to the north-northeastward of this shoal.

7-36 Channel between Poelau Pesemoet and Condor Rif.—Another channel leads from eastward toward the northern coast of Billiton. This channel passes northward of Poelau Pesemoet and southward of Condor Rif.

Poelau Pesemoet ($2^{\circ}30'S.$, $108^{\circ}51'E.$) is a sand cay near the eastern end of the Momparang Eilanden. A mark for Poelau Pesemoet are trees on it which attain heights of 128 feet. Condor Rif, the northernmost danger of the Momparang Eilanden, consists of two small patches of coral with a depth of $2\frac{1}{2}$ fathoms over them. The formation lies nearly $10\frac{1}{2}$ miles northwestward of Poelau Pesemoet, and is not marked by discoloration; however, there are frequently tide rips to be seen over it.

The **directions** for this channel are: Keep the high, conspicuous southern peak of Poelau Nangka bearing not more than 258° , and when near that island change course to pass about 1 mile northward of the island.

7-37 NORTHERN COAST OF BILLITON.—The northern coast of Billiton is about 40 miles long between Tandjoeng Boeroengmandi and Tandjoeng Kelajang.

This entire coast is fringed by coral reefs, sand banks, and rocks. Farther seaward, as far as 10 miles offshore, are a number of small, isolated coral reefs very dangerous to shipping. Most of these dangers are steep-to, and are not marked by

discoloration. It is possible that a number of undiscovered dangers may also lie off this coast.

In connection with navigation through Straat Karimata by ocean-going vessels it can be noted that the usual route leads northward of the reef Florence Adelaide, and that this coast of Billiton is not sighted.

7-38 Landmarks.—A number of peaks useful for position-fixing by coasting vessels by day are available on Billiton.

Goenoeng Klapa Kampit (Kelapa Kampit), a conspicuous conical summit nearly 12 miles west-northwestward of Tandjoeng Boeroengmandi and 5 miles inland, is 708 feet high. The western side of the hill appears rugged when seen from northward.

Goenoeng Sekajoe, a hill, 558 feet high, with a crater-shaped summit and a conspicuous patch of red rock on its eastern slope, is about 16 miles west-northwestward of Goenoeng Klapa Kampit and 2 1/2 miles inland. The western slope of Goenoeng Sekajoe is rugged.

7-39 Tandjoeng Boeroengmandi to Tandjoeng Batoe (Boeding).—The coast between these two points, a section about 17 miles long, has a fringing coral reef, about 1 mile wide near Tandjoeng Batoe, and a number of off-lying dangers.

Teloek Pring (Pering) is a small bay between these two points; the greater part of the bay dries.

7-40 Off-lying dangers.—Karang Tri ($2^{\circ}43' S.$, $108^{\circ}16' E.$, *H. O. Chart 3117*) is a small islet, practically awash, lying nearly 2 1/2 miles northward of Tandjoeng Boeroengmandi.

Poelau Kanis, an islet about 6 1/2 miles northwestward of Karang Tri and 3 1/2 miles offshore, has reef extending nearly 1 mile east-southeastward and west-northwestward from it. The islet, although low, is useful for position-fixing. A light is shown from a white iron skeleton structure, 44 feet high, on Poelau Kanis.

A number of reef patches lie between Karang Tri and Poelau Kanis. The outermost, in a position nearly 4 miles east-southeastward of Poelau Kanis and 4 1/2 miles offshore, has over it a depth of 2 3/4 fathoms.

Poelau Boesoeng Serlang, a small islet with a

yellowish-brown sand bank above water on its northwestern part, lies about 7 miles east-northeastward of Poelau Kanis. The sand bank is said to be usually visible about 4 miles. A reef, over which the depth is 1 fathom, lies about 4 miles southeastward of Poelau Boesoeng Serlang, with two other reefs in the intervening channel.

A dangerous reef, over which the depth is 3 feet, lies nearly 8 miles north-northeastward of Poelau Kanis. From positions near this reef, Poelau Kanis appears as a small, dark hump against the low coast.

A 3-fathom patch lies about 4 miles northwestward of Poelau Kanis, and nearly 3 1/2 miles farther northwestward is a rock over which the depth is 5 feet. A rock, with a depth of 2 1/4 fathoms over it, lies about 9 miles north-northwestward of Poelau Kanis.

7-41 Teloek Boeding (Baai van Boeding).—This bay, which indents the coast to a distance of nearly 3 miles, is entered between Tandjoeng Batoe to the southeastward and Tandjoeng Kroepit to the northwestward. These points are about 2 miles apart. Flowing into the head of the bay is the shallow Soengai Boeding, up which native craft proceed to Boeding, a settlement forming the capital of the districts.

Only small vessels with local knowledge enter Teloek Boeding. The outermost of a number of dangerous reef patches in the approach and entrance is nearly 4 miles northward of Tandjoeng Batoe, and has over it a depth of 1 1/2 fathoms. Poelau Keran, an islet about 2 1/2 miles northwestward of Tandjoeng Kroepit and 1 mile offshore, is rocky, and is marked by trees standing well apart from each other. A narrow passage, marked by **beacons** privately maintained, leads along the eastern side of Poelau Keran and Tandjoeng Kroepit.

Good **anchorage** can be taken by vessels with local knowledge, in the entrance to the bay, in a depth of 3 1/2 fathoms, with the eastern extremity of Poelau Keran in range, bearing 330° , with Tandjoeng Kroepit. The bottom is mud. This anchorage is usually approached by passing north-

ward of Poelau Kanis and thence through the channel off Tandjoeng Batoe.

7-42 The coast trends nearly 12 miles west-northwestward from Tandjoeng Kroepit to Tandjoeng Siantoe. Inland along this section is a low ridge of hills paralleling the coast.

7-43 Off-lying islets and dangers.—A number of rocks, islets, and reefs lie off this section of coast and form a chain, separated from the coast by a narrow channel. The easternmost islet is Poelau Keran.

Poelau Moeloet, a small, rocky islet, lies nearly 4 1/2 miles westward of Poelau Keran. The islet attains a maximum elevation of 220 feet, and is marked by two conspicuous sloping trees rising from surrounding verdure. The islet appears from seaward as a round hillock. Anak Moeloet is an islet, much smaller than Poelau Moeloet, lying close eastward of Poelau Moeloet.

Poelau Boeloe, a vegetation-covered, reef-fringed islet, lies nearly 3 miles eastward of Tandjoeng Siantoe. It attains a maximum elevation of 161 feet. It is the largest islet in the vicinity, attaining a length of 1 mile in an east and west direction and a width across its western and broadest part of about 1/2 mile.

The northern sides of Poelau Moeloet and Poelau Boeloe should not be approached closer than 1 mile.

7-44 Outer dangers.—The outermost dangers along this section of coast are:

A shoal, over which the depth is 2 1/4 fathoms, lying about 4 miles northeastward of Poelau Moeloet.

A rocky formation, which uncovers, lying about 4 1/2 miles northward of Poelau Moeloet.

A shoal, over which the depth is 1 1/2 fathoms, lying about 2 1/2 miles north-northeastward of Tandjoeng Siantoe.

7-45 The coast trends about 8 3/4 miles west-southwestward from Tandjoeng Siantoe to Tandjoeng Kelajang, the northwestern extremity of Billiton. Tandjoeng Siantoe can be identified without difficulty by a conical hill, Siantoe, which stands near the point and is 171 feet high. An

islet, also named Siantoe and 98 feet high, is close northwestward of the point. Sidjoek, the capital of the district, is on the coast in a position about 3 1/2 miles southwestward of Tandjoeng Siantoe.

This section is fronted by reefs and rocks, above water, and should not be approached closer than 4 miles. The outermost danger, a reef over which the depth is 3 fathoms, is about 4 miles west-northwestward of Tandjoeng Siantoe and nearly 3 1/2 miles offshore. A 2 3/4 fathom patch lies about 1 3/4 miles northwestward of Tandjoeng Siantoe.

Tandjoeng Tinggi (Pingi), a point on the coast about 6 miles west-southwestward of Tandjoeng Siantoe, is marked by a hillock. One of the highest of a number of rocks off Tandjoeng Tinggi has a sugarloaf shape with a bright white summit, and lies nearly 2 miles west-northwestward of the point.

Tandjoeng Kelajang and the western coast of Billiton are described in chapter 6.

7-46 STRAAT KARIMATA (H. O. Chart 3117).—This strait is the passage between Billiton and the Momparang Eiland to the westward and the Karimata Eiland and Borneo to the eastward. The route usually taken by ocean-going vessels proceeding from the eastern part of the Java Sea to the Straits Settlements or China leads through Straat Karimata.

The recommended route leads eastward and northward of Discovery Oostbank, Catherine Rif, Ontario Rif, and Florence Adelaide, as shown by dashed lines on H. O. Chart 3117 and further mentioned in the "Caution" note on the same chart. In taking this recommended route, ocean-going vessels do not ordinarily sight the Billiton coast to the westward, nor do they, as a rule, sight the Borneo coast to the eastward.

7-47 Caution.—On several occasions vessels in Straat Karimata have observed floating masses of vegetable matter and debris so large and dense as to be mistaken from the distance for rocks or sand banks.

7-48 Currents.—The horizontal movement of the water in Straat Karimata is principally a drift

current. The tidal currents are diurnal, but their influence is felt only under the coasts of Billiton and Borneo, so that they are of little importance to large vessels proceeding through the strait.

In the open part of the strait the mean rate of the drift current is 1/2 knot in the southeasterly monsoon, and nearly 1 knot during the northwesterly monsoon. These rates vary; a maximum rate of 2 knots has been measured during the southeasterly monsoon, and 1 1/2 knots during the northwesterly monsoon. The direction of the drift current is that of the predominating wind, which is practically that of the direction of the channel itself.

Only during the change of seasons should extra attention be paid to the tidal currents, and even then these currents are not strong in the open parts of the strait. Their directions at such time have been observed as follows:

Between Discovery Oostbank and Tandjoeng Sambar: northwest to west-northwest and south-east.

Between the Momparang Eilanden and the Karimata Eilanden: northwest and southeast.

Westward of Poelau Seroetoe: west and east.

Westward of North Grieg: southwest and north-east.

A survey party, when lying at anchor near the Karimata Eilanden frequently observed a sharply defined line of current demarcation extending to the limit of visibility. This line shifted slowly northward or southward, or across the direction of the tidal currents. With a rising tide there appeared to be two tidal currents here, one setting northward and the other southward, which curved westward after meeting. The color of the water was different on either side of the strip.

7-49 Dangers on the western side of Straat Karimata.—Discovery Westbank ($3^{\circ}39' S.$, $108^{\circ}45' E.$) is a narrow reef on which are a few rocks always above water. The formation lies about 48 miles southeastward of Tandjoeng Batoe Itam, the southeastern extremity of Billiton. A narrow ridge, about 1/2 mile long, of the formation dries. The submerged portions of Discovery Westbank are always marked by dis-

coloration, and they always break, even at high water.

Discovery Rif, about 5 1/2 miles northeastward of Discovery Westbank, are steep-to coral reefs on which are a few rocks above water. At low water a strip about 600 yards long dries. It usually breaks heavily, and the surf can be seen from a considerable distance.

Discovery Oostbank (Discovery East Bank) (Gosong Mampango), nearly 21 miles eastward of Discovery Rif, is a steep-to coral reef with a patch of sand, about 5 feet high, in the middle. This patch is visible at a great distance in clear weather. The tidal currents set southeastward and northwestward in the vicinity of the reef. Discovery Oostbank Light is shown from a red iron framework tower, with white bands, standing on a white octagonal building on white piles, 79 feet high, standing on the bank.

Karang Djoeroek (Lavender Bank), about $14\frac{1}{2}$ miles northwestward of Discovery Oostbank, is a large reef on which are a number of black boulders that uncover at half tide. It is plainly marked by discoloration. The tidal currents in the immediate vicinity set south-southeastward and north-northwestward.

7-50 Cirencester Bank (Karang Batoean), about 8 1/2 miles northward of Karang Djoeroek, is a coral reef with a large black boulder and a small brownish-yellow coral patch on it, both of which dry. The boulder only covers at high water springs.

Cirencester Klip (Shoal), nearly 22 miles northward of Cirencester Bank, is a small reef over which the least depth is 2 fathoms. It is seldom marked by surf or discoloration, but there are frequently tide rips. A small sandbank, over which the depth is $4\frac{3}{4}$ fathoms, lies about 1 1/4 miles south-southwestward of Cirencester Klip. From positions near this shoal the southern peak of Poelau Nangka, in the Momparang Eilanden, is sometimes visible, and also Goenoeng Boeroeng-mandi at the northeastern extremity of Billiton. The usual route through Straat Karimata usually leads too far eastward of Cirencester Klip to sight these landmarks.

Broken water over an area about 250 yards long in a northerly and southerly direction and nearly 200 yards wide, possibly indicating a shoal, was reported in 1938 in a position about 5 3/4 miles east-southeastward of Cirencester Klip.

A 1 3/4-fathom patch was reported (1949) to lie about 10 1/4 miles 102° from Cirencester Klip. A small drying reef was reported (1949) to lie about 7 1/2 miles 128° from Cirencester Klip.

A reef, with a least depth of 2 3/4 fathoms over it, was reported (1949) to lie about 14 1/2 miles 103° from Cirencester Klip.

A submerged wreck lies about 17 1/2 miles 081° from Cirencester Klip; it has been reported that another wreck lies about 28 miles 067° from Cirencester Klip. A dangerous wreck lies about 27 miles eastward of Cirencester Klip in position 2° 55' 0" S., 109° 23' 30" E. A dangerous wreck is located about 23 1/4 miles eastward of Cirencester Klip in position 2° 52' 00"S., 109° 14' 00"E.

Catherine Rif (2° 30' S., 108° 55' E.), the easternmost danger of the Momparang Eilanden (for principal description of this island see section 7-34), has over it a least depth of 5 feet. The reef is not marked by surf or discoloration. The same is true of Whittingham Rif, which has over it a depth of 2 fathoms and lies 3 miles northwestward of Catherine Rif.

7-51 Flying Fish Rif consists of a number of coral patches lying close together in a position about 17 miles north-northeastward of Poelau Nangka and about 25 miles northwestward of Catherine Rif. One patch in the southeastern part of the formation has over it a depth of 2 3/4 fathoms; the depths over the other patches are 7 to 10 fathoms. These patches are seldom marked by surf or discoloration. In clear weather Goenoeng Boeroengmandi, Poelau Nangka, and the highest peaks of the Karimata Eilanden are visible from positions near Flying Fish Rif, but the formation lies just outside the arc of visibility of Poelau Seroetoe Light. A 4 1/4-fathom patch is reported (1956) to lie about 3 3/4 miles north-northeastward of Flying Fish Reef.

Ontario Rif (1° 59' S., 108° 39' E.), lies nearly 13 miles northward of Flying Fish Rif, and consists of a coral reef on which is

a small patch of yellowish-brown sand that dries. When covered it is generally discernible, but at a short distance only, as a light green patch. Bearings useful for avoiding the reef can be taken on the Karimata Eilanden by day and on Poelau Seroetoe Light by night. The usual route through Straat Karimata leads well northeastward of the reef.

Florence Adelaide, about 35 miles westward of Ontario Rif, is a steep-to coral reef over which the depth is 1 3/4 fathoms. This reef is not marked by surf or discoloration. It is very dangerous, being out of sight of land or lights and giving no warning of proximity by sounding.

7-52 Dangers on the east side of Straat Karimata.—For a distance of about 40 miles southward of Tandjoeng Sambar (3° 00' S., 110° 18' E.) successive ridges of long, narrow sandbanks, with deep channels intervening, extend approximately parallel to the coast. The depths over the shoalest parts of these banks are usually 2 to 3 fathoms. Inasmuch as there are no safe passages between these banks, vessels pass well southward of them, out of sight of land.

Fox Banken, the southernmost of these dangers, are not marked by surf, but there are strong ripplings and foaming waves with seas of any size.

Clemencia Bank, about 25 miles south-southwestward of Tandjoeng Sambar, has a least depth of 1 foot over it, and nearly always breaks.

Aruba Banken, between Clemencia Bank and Fox Banken, are almost always marked by tide rips.

Tandjoeng Sambar and the western coast of Borneo are described in section 7-62.

7-53 KARIMATA EILANDEN.—The Karimata Eilanden consist of the large islands Poelau Seroetoe and Poelau Karimata and a number of islets and reefs. The group lies on the eastern side of the northern part of the main route through Straat Karimata.

7-54 POELAU SEROETOE (1° 43' S., 108° 44' E.), the southwesternmost island of the