

than 3 fathoms, fronts the south part of the bay. Fishing stakes are found on this flat. An isolated rock, having a least depth of 5 feet, lies about 3/4 mile southwestward of Laem Lachan.

KLONG BAGATAE (Khlung Thung Ma Phrao) flows into the south part of Ao Kaulak, and serves at the common estuary of several small rivers. The peninsula, of which Laem Ao Kham is the north extremity, forms the west bank of the estuary. The entrance is about 1/2 mile wide; the width between the 3-fathom curves is about 400 yards.

A middle ground, with a least depth of 10 feet, lies on a bar about 3/4 mile within the entrance. A channel, with depths of 6 to 10 fathoms, extends along the northeast side of the peninsula for about 1 mile, and from there the bar can be crossed in a depth of 17 feet. Depths of 3 to 4 1/2 fathoms are then found in midchannel to a position about 3 miles above the entrance where the river bifurcates.

ANCHORAGE—DIRECTIONS.—Small vessels, with local knowledge can anchor in 6 fathoms, mud, about 1/2 mile inside the entrance.

Vessels should approach the entrance by steering 135° in order to pass southward of

the 12-foot rock. Thence the course should be altered to 190° so as to pass not more than 200 yards off the east extremity of the peninsula forming the west side of the entrance.

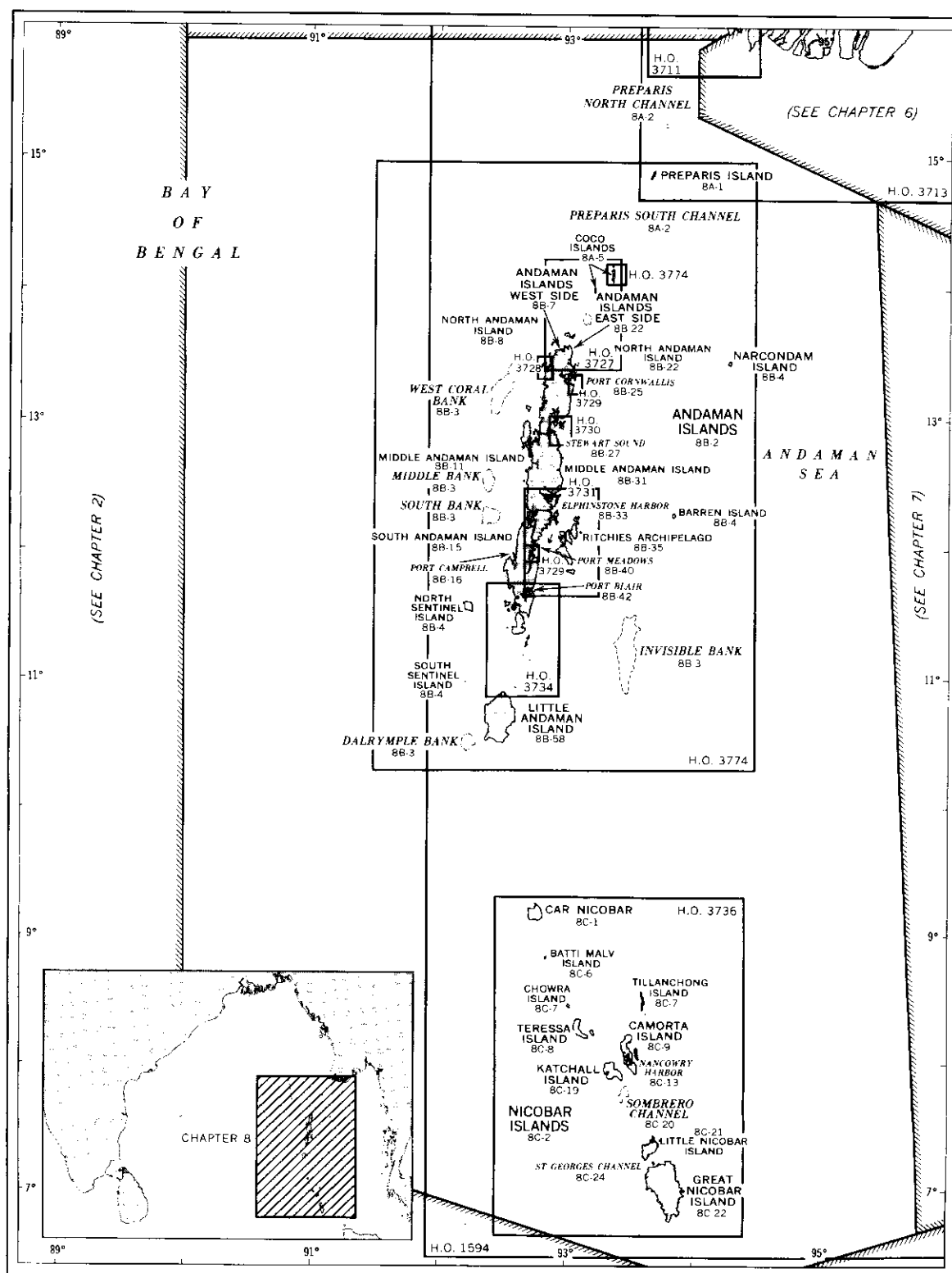
LAEM TAMCHOK TO LAEM PAK PHRA

7F-10 The general aspect of this coast has been described in section 7F-2. A few villages stand along the coast.

Between Laem Tamchok and Laem Pak Phra, the depths gradually decrease from seaward to 6 to 8 fathoms, about 1/2 mile offshore. This coast should not be approached within a distance of 3 miles as it has not been closely examined.

Ko Lumchuk (Hin Talum Phuk), a group of rocks about 6 feet high, with depths of 4 to 5 fathoms close to, lies about 1/2 mile offshore in a position about 7 1/2 miles northward of Laem Pak Phra. Two smaller rocks lie close offshore, about 1/2 mile northward of the group.

Chong Pak Phra, the channel separating Ko Phuket from the mainland, and Ko Phuket are described in H.O. Pub. 70.



CHAPTER 8—GRAPHIC INDEX

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CHAPTER 8

PREPARIS ISLAND AND CHANNELS, AND THE COCO, ANDAMAN, AND NICOBAR ISLANDS

Part A. Preparis Channels and Coco Islands

Part B. Andaman Islands

Part C. Nicobar Islands

PLAN.—This chapter describes Preparis Island, Preparis Channels, Coco Islands, Andaman Islands, and Nicobar Islands. The arrangement is from north to south, and from west to east.

GENERAL REMARKS

8-1 A chain of islands, divided into four groups by well-defined channels, stretches in a vast ellipse between Maw Dengi (Pagoda Point, 15°57'N., 94°15'E.) and the north end of Sumatra, about 630 miles southward. The principal channels leading between the groups are: Preparis North Channel, between Preparis Island and Alguada Reef; Preparis South Channel, between Preparis Island and the northernmost of the Cocos Islands; Coco Channel between the southernmost island of the Andaman Islands; and Ten Degree Channel, between the southernmost of the Andaman Islands and the northernmost of the Nicobar Islands.

NAVIGATION

8-2 Vessels bound from Calcutta or Madras to Rangoon usually pass through Preparis North Channel.

The track from Calcutta to Singapore leads through Preparis South Channel, well northward of Table Island. Vessels often use this channel during the Southwest Monsoon in order to pass eastward and to the leeward of the Andaman Islands. Vessels should keep well northward of Table Island because of the irregularity of the soundings in the vicinity of that island and the strong tidal currents. Vessels passing eastward of Table Island should keep in depths of more than 50 fathoms.

Vessels passing through Coco Channel should pass at least 5 miles southward of Little Coco Island and at least 4 miles northward of Landfall Island.

During the Northeast Monsoon, the banks off the west side of the Andaman Islands may be passed over by vessels of light draft. Ves-

sels of deep draft should not cross the shoaler parts. Navigation inside the banks to within 3 miles of the land is safe, except on the west side of North Andaman Island, to which a berth of 6 miles should be given.

The track from Calcutta to Cape Leewin leads about 11 miles southwestward of Teresa Island of the Nicobar Islands.

The track from Madras to Singapore leads about 7 miles southward of Great Nicobar Island.

WINDS AND WEATHER

8-3 The Southwest Monsoon commences in the Nicobar Islands about mid-May and rapidly extends over the Andaman Islands. From June through September the wind blows from the west through southwest at Force 4 to 6. During the months of October and November, the winds are variable with Force 1 to 3. The Northeast Monsoon prevails from December through March, the prevailing wind is between north and east at Force 2 to 4. During the months of April and early May the winds are variable with Force 1 to 3.

During the months immediately preceding and following the Southwest Monsoon, these island groups lie athwart or close to the tracks of the tropical disturbances of the Bay of Bengal.

The temperatures are relatively high, with little variation from one place to another or between one month and the next. The humidity is high at all times. The mean daily temperatures are in the middle or upper 80°; the mean daily minimum temperatures are in the middle or upper 70°.

Heavy rains with a yearly average of 120 inches occur in these island groups. Rains occur on the west slopes from mid-May

through September, and on the east slopes from October through mid-December. The rainfall is variable both as to seasons and to geographical positions. In the north part of the Andaman Islands, heavy rainfall (over 10 inches per month) falls from June through September. More moderate amounts (5 to 9 inches per month) occur in May, October and November. The months of December through April are relatively dry. In the south part of the Andaman Islands, the heaviest rainfall occurs from May through early November. More moderate amounts fall from early November through December, and relatively small amounts from January through April.

In the Nicobar Islands, heavy rains occur from May through November. More moderate amounts occur from December through mid-January, and relatively small amounts from January through April.

As a rule the islands with the higher elevation receive the greatest amount of rain.

Thunderstorm frequency varies from island to island. The greatest activity occurs during those months immediately preceding and the first few weeks immediately following the onset of the Southwest Monsoon. Thunderstorms occur most frequently during May and June at Port Blair when about 4-6 days per month have them. In November, thunderstorms occur on the average of three per month at this port.

The cloud cover is more uniform, with cloud amounts increasing from north to south. During the Southwest Monsoon, there is little diurnal variation in cloud cover. During the remainder of the year the cloud cover is more extensive in the afternoons. The cloudiest months are June through September. During these months the cloud coverage amounts to 70 to 80 percent, with few clear days. February and March are the months with least cloud coverage. During these months there is 30 to 40 percent coverage in the north and 50 to 60 percent coverage in the south.

The visibility is good except during heavy rains.

TIDAL CURRENTS AND CURRENTS

8-4 The currents in the vicinity of Alguada Reefs are greatly influenced by the winds, especially at neaps. The tidal currents set southeastward on the rising tide and northwestward on the falling tide. During the Northeast Monsoon, the ebb current at springs begins about 2 hours after high water, and runs until low water, at a rate of 1 knot to 2

knots. The period of slack water is very short.

Tide rips have been reported in a position about 19 miles westward of Alguada Reefs.

The tidal currents in Preparis North Channel appear to set southeastward on the rising tide and northwestward on the falling tide. During the Northeast Monsoon, there is a strong southgoing current of from 1 knot to 1 1/2 knots, which at neaps entirely overcomes the northwesterly tidal current. A northgoing current of 1/2 to 3/4 knot has been experienced. The southgoing current has a rate of about 2 knots.

The tidal currents in South Preparis Channel in the vicinity of Table Island are strong and often set toward the rocks.

The tidal currents set very strongly through Marshall Channel and heavy tide races occur. The rate is upwards of 5 knots in the fairway and about 2 knots past the north and south ends of Little Coco Island.

The tidal currents in the vicinity of the Coco Islands set eastward on the rising tide and westward on the falling tide. In settled weather, the tidal currents appear to turn at high and low water. Heavy tide races are found off all salient points.

The tidal currents in Coco Channel, during settled weather, are regular, the current setting eastward on the rising tide and westward on the falling tide, at rates of 1 knot to 2 knots at springs. Strong winds influence the tidal currents at times, even reducing them. During the Northeast Monsoon, the current frequently sets northwestward through Coco Channel, but during the Southwest Monsoon the set is mostly easterly. Tide-rips occur in the vicinity of all shoal water in Coco Channel.

The tidal currents during the Northeast Monsoon set southwestward and southward along both the east and west coasts of the Andaman Islands. During the Southwest Monsoon the set is northward to eastward.

In light breezes and fine weather, the tidal currents set eastward and westward into Duncan Passage, but sometimes a current caused by the prevailing winds sets through it.

Within a few miles of the Nicobar Islands, the tidal currents usually set northeastward on the rising tide and southwestward on the falling tide. The tidal currents attain a rate of 3 to 4 knots in the channels between the islands. Well offshore of these islands, the currents usually set with the prevailing wind. The rate, at times about 2 knots, and direction are variable. Heavy overfalls were

reported (1919) in a position about 110 miles west-southwestward of the south end of Great Nicobar Island.

The currents in the vicinity of Car Nicobar Island flow rapidly enough to cause tide races, particularly northward of the island. During the month of February, usually a calm month, from a position about 6 to 8 miles eastward of the island, a current setting southwestward at a rate of 7 knots has been experienced about 1 1/2 hours after high water.

The tidal currents in the vicinity of Chowra Island set northeastward during the rising tide and southwestward during the falling tide.

The tidal currents in Sombrero Channel set northwestward on the rising tide and southeastward on the falling tide. These currents are reported to attain a rate of 5 knots at springs.

The tidal currents in St. Georges Channel are strong and set fairly through the channel, northeastward on the rising tide and southwestward on the falling tide.

CAUTIONS

8-5 Less water than charted was reported (1961) in an area from a position 19 miles westward of Pa-thein (Alguada Reef) Light Structure, southeastward to a position about 18 1/2 miles south-southwestward of the light structure.

Preparis Island is reported to lie about 3 1/2 miles westward of its charted position. The entire group of Andaman Islands were reported to lie 1 1/4 miles eastward of their charted positions.

Preparis South Channel is dangerous to submarines diving, as mines may still exist.



PA-THEIN (ALGUADA REEF) LIGHTHOUSE

Bearing 092°

Although the shoals off the north end of the Andaman Islands have been examined, there is a possibility that less depths than are charted may exist over them. These shoals are not always visible from aloft and vessels are cautioned not to attempt to pass over them.

Narcondam Island was reported (1946) to lie 2 1/4 miles westward of its charted position.

The Andaman Islands lie on a line of fault, but no earthquakes have been reported in recent years.

PART A. PREPARIS CHANNELS AND COCO ISLANDS

8A-1 PREPARIS ISLAND (north end, 14° 54'N., 93°42'E.), narrow, wooded and sloping gradually to the sea, is about 265 feet high. A reef fringes the island and a shoal spit extends 3 1/2 miles southward from its south end. Preparis Island gives a good radar return from a distance of 24 miles.

Cow and Calf Islets, flat-topped, three in number and about 77 feet high, lie close together in a position about 1 3/4 miles northward of Preparis Island.

An extensive reef, on which there are some islets, the largest of which is 92 feet high, lies about 1 1/4 miles westward of Preparis Island.

A reef, on which stands a pinnacle rock, 40 feet high, lies about 4 miles southwestward of the south end of Preparis Island. A reef, on which there is a small rock, 6 feet high, lies about 1/2 mile southward of the south end of this reef.

Several coral heads, with depths of 1 1/4 to 2 fathoms, lie within 1 1/4 miles of the southeast side of Preparis Island. A rock lies awash about 1/4 mile off the east coast in a position about 3/4 mile southward of the north point of the island. A pinnacle rock, with a least depth of 1 1/2 fathoms, lies 1 3/4 miles eastward of the north end of the island.

ANCHORAGES can be taken in 12 to 14 fathoms off the east coast of Preparis Island during the Southwest Monsoon.

CHANNELS-DANGERS

8A-2 PREPARIS NORTH CHANNEL lies between Preparis Island and Alguada Reefs, located about 55 miles to the north-northeastward. The channel is for the most part deep and clear. Thalia Shoal, with a least depth of 10 fathoms, is located about 37 miles south-

westward of Pa-thein (Alguada Reef) Light Structure. The depths around the shoal are irregular, the bottom consisting of gray sand and coral.

PA-THEIN (Alguada Reefs) are located nearly 16 miles southward of Maw Dengi. They are nearly awash at high water spring tides. Detached sunken rocks extend a considerable distance from them. Hugh Rose Rock lies awash at the north end of the reef in a position about 2 1/2 miles north-northeastward of the light structure. A 1 1/2-fathom patch lies about 3/5 mile southward of the rock. A 2 1/4-fathom patch is located about 1 1/4 miles southward of the light structure, and depths of 7 fathoms and less extend to a distance of nearly 3 miles south-southwestward from the light structure.

A LIGHT is shown from the southwest end of Pa-thein Reef. A staff is charted about 1,400 yards northeastward of the light structure. Pa-thein Light Structure gives a good radar return from a distance of 16 miles and is identifiable with charted features for a distance of 14 miles.

NOTE.—The dangers between Hugh Rose Rock and Diamond Island are described in section 6A-12.

OFF-LYING PATCHES.—An 8-fathom patch was reported (1946) about 15 miles westward of Pa-thein Light Structure. In 1964, a 5-fathom shoal, position approximate, was reported to lie about 17 1/2 miles 278° from the above light structure.

PREPARIS SOUTH CHANNEL, between Preparis Island and the Coco Islands, has depths of 109 to 150 fathoms and a width of 34 miles between the dangers on either side. See sections 8-2 and 8-5.

TIDAL CURRENTS AND CURRENTS

8A-3 See section 8-4.

WINDS AND WEATHER

8A-4 See section 8-3.

COCO ISLANDS—COCO CHANNEL

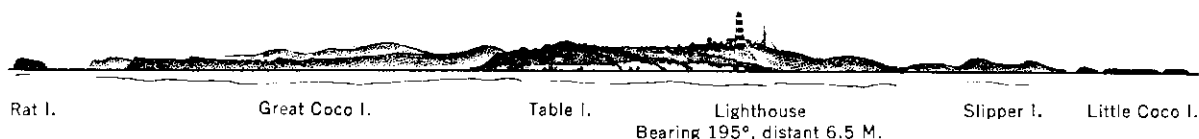
8A-5 The COCO ISLANDS consist of Table Island, Great Coco Island, and Little Coco Island. Table Island (14°11'N., 93°23'E.) is 146 feet high and is densely wooded, except on its southwest side. The island appears as a flat, level surface with steep-to sides on all bearings. Table Island gives a good radar return from a distance of 16 miles. Table Bay indents the southwest side of the island. A LIGHT is shown from the southwest and highest part of the island.

Slipper Island, about 400 yards northwestward of the northwest end of Table Island and connected to it by a drying reef, is 113 feet high and covered with grass. A few trees stand on the summit of Slipper Island and a conspicuous pillar rock stands near the west end of the island. A stepping-stone causeway, passable at half tide, extends across the drying reef between the east point of Slipper Island and Table Island.

DANGERS.—Numerous rocks and shoals lie off the above islands, within the 10-fathom curve. These shoals extend 3/4 mile northwestward from Slipper Island and 1/2 mile northeastward and southward from Table Island. A detached 6 1/2-fathom patch lies about 1 1/4 miles northeastward of Table Island, and irregular depths which cause tide rips and swirls, extend 4 1/2 miles northeastward from the island. An 8-fathom bank, marked by tide rips, lies nearly 1 1/4 miles eastward of Table Island.

ANCHORAGES.—During the Northeast Monsoon, anchorage can be taken about 600 yards offshore in Table Bay, in 10 fathoms, rock, with the light structure bearing 012°. CAUTION is required as this position is close to the reef and the tidal currents farther out are strong.

During the Southwest Monsoon, anchorage can be taken about 800 yards off the north side of the island in 9 to 12 fathoms, sand and rock, with the light structure bearing 180°. This is an exposed anchorage.



COCOS ISLANDS—TABLE ISLAND

JETTY.—In Table Bay, there is a small stone jetty, about 50 feet long, located close southward of the light structure. The approach to this jetty is marked by a white square board in line with the eastern white-washed gate of the lighthouse fence.

The landing place, on the north side of the island, is approached by a channel, 300 feet wide at its outer end, and about 150 feet wide near the beach. The channel is marked by two or three iron stakes located on the reef on either side of the channel.

MARSHALL CHANNEL separates Table Island from the north point of Great Coco Island, about 1 1/2 miles southward. The fairway, which lies in midchannel, is about 1/2 mile wide and has depths of 5 1/2 to 9 fathoms. Tidal currents are strong. See section 8-4.

8A-6 GREAT COCO ISLAND rises steeply from the sea on its west side; its east side slopes gradually to the sea. The island is densely wooded, except for a few bare patches on its west side. There are no outlying dangers, but rocky and foul ground extends 500 yards from its north extremity and 700 yards from its northwest extremity. A belt of coconut palms is found along the shores of the island. Great Coco Island gives a good radar return from a distance of 23 miles.

Pollok Bay lies between the north point of the island and Pechee Point, about 1 mile southeastward, the latter point is a bluff, 150 feet high, surmounted by a few trees and connected with the mainland by a low neck, on which is a small fresh-water lagoon. A coconut plantation extends on either side of the root of the low neck of land. The bay is reef strewn. Binnacle Rock, about 14 feet high, stands on the outer edge of the fringing reef.

Ford Bay lies between Pechee Point and Rat Islet, 125 feet high and wooded, about 1 mile southward. Reefs extend about 400 yards eastward from the islet, and others connect it with the main island westward.

ANCHORAGE can be taken in the outer part of Ford Bay in a position about 2/3 mile northward of Rat Islet. This anchorage, which has depths of 7 to 10 fathoms, offers protection from strong westerly winds.

JERRY ISLAND, 97 feet high and surrounded by reef, is connected to the south end of Great Coco Island by a reef. Rocky ground, with uneven depths, extends about 2 miles southward from the island.

LITTLE COCO ISLAND, densely wooded and having its coasts lined by a belt of coconut palms, is separated from Great Coco Island and Jerry Island by Alexandra Channel. Vessels using this channel should give the south end of Jerry Island a berth of at least 3 miles.

DANGERS.—Irregular depths extend about 1 3/4 miles northward from the north end, and foul, uneven ground extends about 4 miles southward from the south point of Little Coco Island. The reef, that fringes the island, extends only a short distance from its east and west sides, but extends about 1/2 mile from its north end and a similar distance from its southwest point.

Investigator Patch, over which there is a least depth of 1 1/2 fathoms, is an area of shoal and rocky ground, located about 2 miles east-southeastward of the south end of the island.

Rocks, some of which are awash, lie on the foul ground that extends 4 miles southward from the south end of Little Coco Island. Middle Rock, with a depth of less than 6 feet, lies about 2 miles southward of the above point. Daphne Rock, a small coral patch with a depth of 2 3/4 fathoms or less, lies about 1/2 mile farther southward. South Patch, with a depth of 7 fathoms and possibly less, lies about 1 1/2 miles south-southeastward of Daphne Rock.

ANCHORAGE.—During easterly winds, sheltered anchorage, in 9 to 12 fathoms, sand and mud, can be taken in Lambert Bay, on the west side of the island. The depths shoal gradually. The bottom is rocky and foul on the east side of the island.

COCO CHANNEL, which separates Coco Island from the Andaman Islands, is wide and deep. Irregular depths are found in the south part of the channel; the bottom is coral with occasional patches of mud and sand. A 10-fathom patch, over which there is a heavy sea during strong winds, is located about 10 1/2 miles east-northeastward of the north end of Landfall Island.

See sections 8-2 and 8-4, for additional information on Coco Channel.

PART B. ANDAMAN ISLANDS

8B-1 LANDFALL ISLAND (north end, 13° 40'N., 93°02'E.), 260 feet high in its north part, is fringed by a reef that extends as far as 1/2 mile offshore in places. Landfall Rocks, 42 feet high and prominent, stand on the reef fringing the south end of the island.

East Island, about 3/4 mile eastward of Landfall Island, is separated from the latter by a narrow boat channel, with a least depth of 3 fathoms.

Anchorage can be taken in the middle of the channel between the southeast end of Landfall Island and the southwest side of East Island. The approach is from the southward.

Channel Islet, a large rock, 96 feet high, lies about 700 yards off the east side of Landfall Island and close to the reef that fringes that island.

Hickman Shoal, which consists of two small patches located nearly 2 miles northward of the northwest end of Landfall Island, has a least depth of 4 1/2 fathoms. Between Hickman Shoal and Landfall Island, and also eastward of the shoal, are several patches with 2 3/4 to 5 1/2 fathoms over them. Shoals with depths of less than 5 fathoms lie within 2 miles northwestward of the north end of the island.

Ranger Reef has a least depth of 6 feet and lies about 2 miles eastward of the north end of East Island. Two 5-fathom patches lie about 1/2 mile and 3/4 mile, respectively, northward of Ranger Reef. In heavy weather the seas break over the reef, but at other times it is difficult to identify. Tide rips occur in its vicinity, and between it and the north end of East Island.

Jackson Ledge, over which there is a depth of 1 3/4 fathoms, lies about 3 1/4 miles eastward of the northeast point of East Island. It is marked by tide rips.

Tide rips were reported westward of Jackson Ledge in a position about 1 mile southeastward of the northeast end of East Island.

GENERAL REMARKS

8B-2 ANDAMAN ISLANDS, a group of 204 islands, islets and rocks, lie between the parallels of 10°30'N. and 13°40'N. and the meridians of 92°11'E. and 94°13'E. The principle islands are North Andaman, Middle Andaman,

South Andaman, Baratang, and Rutland, located close together and forming one block. Little Andaman Island lies about 30 miles farther southward. These islands are known collectively as the Great Andamans. North Andaman and Little Andaman Islands give good radar returns from a distance of 18 miles. South Andaman Island gives a good radar return from a distance of 17 miles.

The principal groups of small islands are the Ritchies Archipelago, located off the east side of Baratang Island, and the Labyrinth Islands, located off the southwest coast of South Andaman Island. The chief outlying islands are North Sentinel, Barren Island, 1,158 feet high, a volcano that has been inactive for some 100 years, and Narcondam 2,330 feet high. The latter is an extinct volcano, located 70 miles eastward of the main group.

The Andaman Islands consist of a mass of hills enclosing very narrow valleys. The hills rise to a considerable height, especially on the east coasts of the large islands. Most of the islands are covered with a dense tropical forest. There are few perennial streams.

The islands are deeply indented, forming a number of harbors, some very spacious. The principal ports or harbors on the west coasts of the islands are Temple Sound, Port Anson, Port Campbell, Port Mouat, and Macpherson Strait. Those on the east coast include: Port Cornwallis, Stewart Sound, Elphinstone Harbor, Colebrooke Passage, Port Meadows, and Port Blair. The latter is the administrative center for the whole group.

Plans were underway (1965) to develop the Andaman Islands as a Naval Base and a Fishing Center.

DEPTHS-DANGERS

8B-3 The reefs and dangers off the west coasts of the Andaman Islands are more extensive than those off the east coasts. Shoal patches lie up to 21 miles off the west coast. Shoals are very numerous around the northern Andaman Islands. See section 8-5.

OFF-LYING BANKS AND DANGERS.—West Coral Bank, Middle Bank and South Bank, composed of dead coral and sand, with some patches of live coral, lie off the west side of the Andaman Islands. The water over these banks is very clear and judging from the ap-

pearance of the bottom, it seems probably that rollers break on Middle Bank during the Southwest Monsoon, though they may not do so on the other banks. The 100-fathom curve passes close westward of these banks, and the increase of swell usually indicates their general location. See section 8-2 for navigating in the vicinity of these banks.

West Coral Bank, the northernmost of these banks, lies from 15 to 23 miles westward of North Andaman Island. The bank has a least depth of 6 fathoms, rocky bottom, at a position about 29 miles westward of Saddle North Peak.

Middle Bank, the shoalest part of which lies about 17 miles westward of Middle Andaman Island, has a least depth of $3\frac{3}{4}$ fathoms in a position 15 miles westward of Flat Island.

South Bank has a least depth of 6 fathoms in a position about 16 miles westward of Spike Island.

Dalrymple Bank, nearly circular in shape and having a diameter of 7 miles, is centered in a position about 9 miles westward of the southwest end of Little Andaman Island. The depths over ridges of rocks near the center are $5\frac{1}{2}$ fathoms, but less depths may exist. Elsewhere, they vary from 11 to 20 fathoms. The bottom is dead coral. Heavy rollers are found on the bank, during the Southwest Monsoon.

In 1951, a 6-fathom shoal was reported to lie about 23 miles west-southwestward of the southwest end of Little Andaman Island.

Invisible Bank, extensive and not marked by discoloration, lies about 47 miles eastward of the Cinque Islands. The shallowest part is near the center; here Flat Rock, 30 yards in diameter and awash, rises from a bank over which there are less than 10 fathoms, about 1 mile wide and 5 miles long. The limits of the 20-fathom area lie 2 miles southwestward and 7 miles northward of Flat Rock.

OFF-LYING ISLANDS

8B-4 North Sentinel Island ($11^{\circ}33'N.$, $92^{\circ}14'E.$), separated from the Labyrinth Islands (sec. 8B-19) by a wide and deep channel, is 400 feet high, densely wooded, and has a level ridge which slopes to the northwest point, which is very low. Depths of 23 to 52 fathoms, ooze, are found in the channel. North Sentinel

Island gives a good radar return from a distance of 13 miles.

The island is reef-fringed to a distance of $\frac{1}{2}$ to $\frac{3}{4}$ mile. No dangers, except those southward of the anchorage, exist outside the reef. The 100-fathom curve lies 3 miles westward of the island. Four islets stand on the reef, the largest is Constance Islet about 60 feet high, off the southeast point of the island.

ANCHORAGES.—Vessels can anchor in 10 fathoms, $\frac{1}{2}$ mile off the east side of North Sentinel Island, with its northeast point bearing 283° . Sunken dangers lie south of this fair weather anchorage.

Anchorage can be taken by small vessels with local knowledge in fair weather, in 12 fathoms, about $\frac{1}{2}$ mile off an entrance through the reef which is just eastward of a small islet off the south side of the island. This anchorage is located about $\frac{3}{4}$ mile westward of Constance Islet.

SOUTH SENTINEL ISLAND ($10^{\circ}58'N.$, $92^{\circ}14'E.$), located 15 miles northwestward of Little Andaman Island, is 144 feet high to the tops of the trees and level-topped. Its appearance is much the same on all bearings. A bank, as defined by the 20-fathom curve, surrounds the island and extends about 6 miles northwestward from it. There are considerable depths in the channel between the island and Little Andaman Island.

ANCHORAGE can be taken in 14 fathoms off the west side of South Sentinel Island with the center of that island bearing 101° , distant $\frac{4}{5}$ mile. The west side of the island is the most shelving. Another anchorage can be taken in about the same depths, with the center of the island bearing 281° , distant $\frac{4}{5}$ mile.

NARCONDAM ISLAND ($13^{\circ}26'N.$, $94^{\circ}17'E.$), located about 74 miles eastward of the north end of North Andaman Island, is an extinct volcano, 2,330 feet high and shaped like a truncated cone. Several small above-water rocks lie close around it, outside of which there appears to be considerable depths. See section 8-5 for cautions.

Barata Bay, which can be identified by a grove of palm trees, slightly indents the east side of the island. The bay has a shingle beach.

BARREN ISLAND ($12^{\circ}16'N.$, $93^{\circ}51'E.$), located about 72 miles south-southwestward of Narcondam Island, is 1,158 feet high, with densely wooded cliffs rising sheer from the

water's edge. The outer slopes of the crater, which is located near the center of the island, are covered with foliage. The interior of the crater is visible through a gap in its west side. A thin column of steam issues from a sulphur bed on the side and near the summit. There are no known dangers within 1/2 mile of the island.

ANCHORAGE can be taken in 15 fathoms about 400 yards off a beach on the southwest side of the island. The tidal currents at half flood at the anchorage were reported as setting southeastward at a rate of 2 1/2 knots.

TIDAL CURRENTS AND CURRENTS

8B-5 The tidal currents in Cleugh Passage, between Landfall Island and North Andaman Island, set about east-southeastward on the rising tide and west-northwestward on the falling tide. The rate at springs is about 1 1/2 knots. Tide rips occur throughout the passage.

The current off the seaward side of the Labyrinth Islands, which are located off the southwest side of South Andaman Island, sets southward, but it occasionally reverses its direction for periods of about 24 hours.

The tidal currents in Macpherson Strait, between Little Andaman Island and Rutland Island, set eastward on the rising tide, and westward on the falling tide, turning at about the times of high and low water. The tidal currents are strong only in the narrows northeastward of Rifleman Island.

The tidal currents in Diligent Strait, between the Ritchies Archipelago and Baratang Island, are weak, but with strong southerly winds there is probably a considerable northerly set in the narrowest part of the strait between Wilson Island and Strait Island.

For further information on tidal currents and currents, see section 8-4.

WINDS AND WEATHER

8B-6 See section 8-3.

CLEUGH PASSAGE

8B-7 CAPE PRICE (13°35'N., 93°02'E.), the north end of North Andaman Island, is densely wooded and slopes gradually to the sea. The south shore of Cleugh Passage, between Cape Price and Cape Thornhill, about 7 miles west-southwestward, is indented, densely wooded, and for the most part fringed with mangroves.

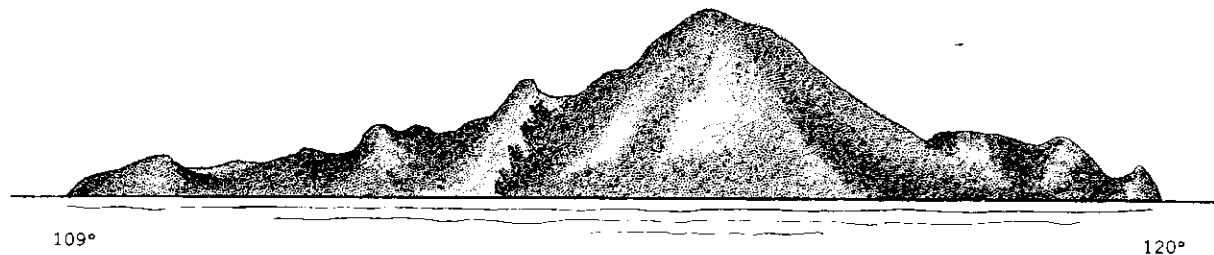
CLEUGH PASSAGE, which separates Landfall and East Islands (sec. 8B-1) from the north end of North Andaman Island, is navigable for vessels having local knowledge. Passage through it, however, is not recommended as there are no clearing marks for the many dangers and the tidal currents are strong. See section 8B-5. The general depths in the passage are from 11 to 31 fathoms, but patches of less than 10 fathoms are numerous. A 6-fathom shoal is located about 1 mile northwestward of Wedge Rock.

Cleugh Rocks, located about 1 1/2 miles south-southwestward of the southwest end of Landfall Island, stand on a reef, the west part of which dries about 8 feet.

Passage Rock, located about 1/2 mile southeastward of Cleugh Rocks and nearly in mid-channel, is marked by breakers and is steep-to.

Wedge Rock, located about 1 1/2 miles west-northwestward of Cape Price, is about 6 feet high and is fringed by a drying reef. A shoal, with depths of 2 1/2 to 4 1/2 fathoms, lies about 1 mile westward of Wedge Rock. A rock, 3 feet high and surrounded by depths of less than 5 fathoms, lies about 1/2 mile southward of this shoal in a position about 2 2/3 miles westward of Cape Price.

Summit
Bearing 115°, distant 10 M.



NARCONDAM ISLAND FROM WEST-NORTHWESTWARD

One Fathom Patch, has a depth of 6 feet and lies about 3/5 mile northward of Cape Price. It breaks in heavy weather. Depths of 3 1/2 to 6 1/2 fathoms are found in the channel between One Fathom Patch and Cape Price. A 2 3/4-fathom patch lies about 1/2 mile westward of the Cape.

WEST ISLAND, 178 feet high, reef-fringed, and densely wood, lies in the west approach to Cleugh Passage in a position about 3 1/2 miles north-northwestward of Cape Thornhill. Depths of less than 5 fathoms lie up to 1/2 mile off the island. Several patches, with depths of 4 to 4 3/4 fathoms, lie between West Island and Wedge Rock. A 3-fathom patch lies about 2 miles eastward of the south extremity of West Island.

WEST COAST OF NORTH ANDAMAN ISLAND

8B-8 ASPECT.—Between Cape Thornhill (13°32'N., 92°56'E.) and Shark Islet, which is located about 18 miles northward of Austin Strait, the southern limit of North Andaman Island, are many summits conspicuous at some distance from the coast. Taylor Hill, located about 6 1/4 miles south-southeastward of Cape Thornhill, is a long ill-defined summit, 644 feet high. D'Oyley Peak, 522 feet high and pointed, is located about 8 miles southward of the same cape. Tasou (Tuson) Hill, 790 feet high and having three summits of nearly equal height with only a slight dip between them, is located about 6 1/2 miles south-southwestward of D'Oyley Peak. Tradikeli Hill, 1,110 feet high, a sharp ridge with a peak at its south end, is located about 8 miles southward of D'Oyley Hill. Saddle North Peak, 2,247 feet high and having a flat top with a sharp peak at its north end, is located about 23 miles southward of Cape Price. Saddle Hill, 2,402 feet high, is a rounded summit located about 2 3/4 miles southward of Saddle North Peak. The peak and the hill are covered with vegetation and appear as a saddle when viewed from westward or eastward.

The above hills are located some distance inland of the west coast of North Andaman Island.

COASTAL HILLS.—Conspicuous hills stand near the west coast of the island. Browns Hill, 300 feet high, is located 1 mile southeastward

of Cape Thornhill. Jessop Hill, 440 feet high, stands on a point at the head of Hudson Bay in a position about 15 miles south-southwestward of the above cape. Lowis Hill, 360 feet high, stands on a peninsula, separating the above bay from Casuarina Bay, in a position about 1 1/4 miles southward of Jessop Hill. All the above hills have twin summits.

COAST.—Between Cape Thornhill and Bluff Point, about 4 1/2 miles southwestward, the coast is somewhat indented and lined with mangroves. The latter point is 230 feet high, has an irregular summit, and is prominent. It is bold and cliffy and presents three summits when viewed from the south-southwestward.

ISLANDS AND DANGERS.—See section 8-5 for cautions. West Island and the dangers between it and Wedge Rock are described in section 8B-7.

Thornhill Island, separated from Cape Thornhill by a narrow channel in which there is a least depth of 2 1/4 fathoms, is 254 feet high. A reef, with rocks 3 feet high on it, lies about 1/4 mile northeastward of Thornhill Island.

White Cliff Island, located about 1 1/2 miles westward of Thornhill Island, is 110 feet high. Cliffs, 66 feet high and dark in color, back the north end of the island. Reefs surround the island, except at its north end which is rather steep-to. Considerable depths are found in the channel between the two islands.

Reef Island, located about 1 1/4 miles southward of White Cliff Island, is low and covered with trees, the tops of which are 140 feet high. A fringing reef surrounds the island except on its east side. Shoal ground, as defined by the 3-fathom curve, extends nearly 1 mile west-southwestward from the southwest point of the island. Some 5-fathom patches lie about 1 1/4 miles off the west side of the island. Irregular depths of less than 10-fathoms lie up to 2 1/2 miles west-southwestward of the southwest point of the island. Some 5-fathom patches lie, respectively, about 1/2 mile south-southeastward, about 1/2 mile east-southeastward, and about 3/4 mile eastward of the south end of Reef Island.

TEMPLE SOUND

8B-9 BLUFF POINT (sec. 8B-8) forms the

east point of the north entrance of Temple Sound. DeBerry Rocks, located 1/2 mile southwestward of Bluff Point, are about 1 foot high. The sound lies between Shearme Island and Point Island on the east and west, and Paget Island on the north.

DEPTHS in Temple Sound are very irregular, and caution is necessary both when entering and when anchoring.

ISLANDS AND DANGERS.—Shearme Island, located 4 miles southward of Bluff Point, is separated from North Andaman Island by a narrow and shallow channel. The island is about 190 feet high and is fringed on its seaward sides by a drying reef. Oldham Rocks, 800 yards north-northeastward of the northwest point of Shearme Island, are 10 feet high. Sugarloaf Island, a conspicuous conical rock, 65 feet high, lies about 1 1/2 miles south-southwestward of the southwest point of Shearme Island.

Paget Island, about 5/6 mile northwestward of the northwest point of Shearme Island, is 250 feet high to the tree tops. Its summit is somewhat flattened, and on the southeast side are cliffs 100 feet high. The island is fringed by a drying reef, except on its east side, that extends as far as 800 yards northward from its northeast point. A spit, as defined by the 3-fathom curve, extends 4/5 mile northward from the latter point. Foul ground extends 3/4 mile eastward from the northeast side of the island.

Two dangerous shoals lie northeastward of Paget Island in the middle of the north entrance of Temple Sound. The channel through the sound is bordered by numerous shoals, the positions of which may best be seen on the chart.

Point Island (13°24'N., 92°50'E.), located about 800 yards southwestward of Paget Island and separated from it by a very narrow channel having a least depth of 3 1/2 fathoms, covered with trees, the tops of which are about 150 feet high. It is almost entirely surrounded by a drying reef, on the south and east sides of which mangroves grow. Reefs and shoal ground extend about 3/4 mile from the southwest side and about 1 1/4 miles from the northwest end of the island.

Bolton Shoal, which lies nearly in the middle of the south entrance of Temple Sound, has a least depth of 5 fathoms. A bank, as defined

by the 10-fathom curve, extends about 9/10 mile south-southeastward from the south point of Point Island and nearly joins Bolton Shoal.

ANCHORAGE, sheltered from all except southwesterly winds, can be taken in 10 to 12 fathoms, mud and sand, in the center of the sound about midway between Shearme Island and Point Island. Small vessels can anchor in 8 fathoms in a position about 1/4 mile westward of Oldham Rocks.

WEST COAST OF NORTH ANDAMAN ISLAND (CONTINUED)

8B-10 Between Point Stuart (13°22'N., 92°51'E.) and the west entrance of Austin Strait, about 29 miles southward, the coast is very irregular and is fronted by numerous islets, rocks, and shoals. Reef Inlet is the south entrance of a narrow and shoal channel that separates Shearme Island from the mainland. Hudson Bay, entered about 5 miles southward of Point Stuart, and Casuarina Bay, 3 miles farther southward, are both shallow and completely open westward.

ISLANDS AND DANGERS.—West Coral Bank, the outer danger off this coast, has been described in section 8B-3. Other dangers lying near the coastal tracks are described below.

Mackey Bank, over which there is a depth of 4 fathoms, lies about 5 1/2 miles west-southwestward of Sugarloaf Islet. Vessels should pass well seaward of this shoal.

Shark Island (13°12'N., 92°46'E.), about 10 1/2 miles south-southwestward of the above islet, is sandy and covered with bushes about 20 feet high. A reef, with rocks above water, fringes the island. Vessels should pass well outside this islet.

North Reef Island, low, flat, wooded and marshy, is located about 6 1/2 miles south-southwestward of Shark Island. A reef extends about 2 miles southward from the south end of the island.

Latouche Island, wooded and of sandstone, lies close off the northeast point of North Reef Island. A spit extends about 600 yards southward from Latouche Island. A 2-fathom patch lies about 1 1/2 miles southeastward of the east end of North Reef Island.

Interview Island, located 4 1/2 miles south-

ward of the south end of North Reef Island, is low at its north point, but rises gradually to a height of 370 feet. The highest part of the island is a wooded plateau. The south end of the island terminates in a cliff, close off which is a rocky pinnacle, 22 feet high. Reefs and shoals extend about 2 miles north-north-eastward from the island.

South Reef Island, located about 1 mile southwestward of the south end of Interview Island, stands on a spit of stone, as defined by the 3-fathom curve, that extends about 3 miles southward from that island.

ANCHORAGES.—Vessels having local knowledge can anchor in 6 1/2 to 9 fathoms in a position about 2 miles eastward of the south end of North Reef Island. Caution is required to avoid a 3-fathom patch and a 2-fathom patch that lie about 1 1/2 miles and a little over 2 miles, respectively, east-northeastward of the south point of North Reef Island. Vessels approaching from the northwestward should round Latouche Island at a distance of 1/2 mile, in order to avoid a 3 1/2-fathom shoal that lies about 1 1/2 miles northward of that island.

AUSTIN STRAIT—WEST COAST OF MIDDLE ANDAMAN ISLAND

8B-11 AUSTIN STRAIT separates North Andaman Island from Middle Andaman Island. The strait is shoal and can only be used by boats. The shoalest parts are over the bars at either entrance. The west entrance, located about 8 1/2 miles southeastward of the north end of Interview Island, is approached through Interview Sound which lies between the north part of Interview Island and the mainland. Numerous islands, rocks and shoals lie in the sound.

COAST.—White Mountain, 1,184 feet high and located about 7 miles east-southeastward of the west entrance of Austin Strait, stands at the north end of the eastern coastal range of Middle Andaman Island. White Mountain appears whale-backed when seen from the southwestward. The west coast of the island, between Tuft Island, located about 6 miles south-southeastward of the south end of Interview Island, and the west entrance of Andaman Strait, is bold and precipitous. Tuft Island is sandy and about 10 feet high.

Port Andaman, of little commercial importance, lies between South Reef Island (sec. 8B-10) and Anderson Island, which is narrow and which lies close off and parallel to Middle Andaman Island. At its entrance the water is muddy and there are irregular depths over a rocky bottom. Port Andaman leads northward to Interview Passage, a narrow channel between Interview Island on the west, and Anderson Island, with Bennett Island northward of it, on the east. This area is dangerous, and until closer examination can be made, it should be avoided.

Buchanan Passage, which separates Anderson Island from the mainland to the eastward, is encumbered with rocks and dangers.

Rocky Point, the extremity of a promontory projecting about 1 1/2 miles westward from the adjoining coast, is located about 4 1/2 miles south-southwestward of Tuft Island. Hump Island lies about 3/4 mile off the coast in a position about 3 miles southward of Tuft Island. Flat Island lies 1 mile off the coast in a position about 9 miles southward of the same island.

A shoal, with a depth of 6 fathoms, lies about 2 1/2 miles westward of Rocky Point. Middle Bank, the outer danger off this coast, is described in section 8B-3.

WEST ENTRANCE OF ANDAMAN STRAIT

8B-12 The west entrance of Andaman Strait, which separates Middle Andaman Island from South Andaman Island, is divided into two channels by Spike Island. There is fairly deep water in the outer part of the main entrance which lies northward of the latter island. This channel is entered between the west entrance point of Foul Bay and Breaker Point, the northwest extremity of Spike Island, about 1 3/4 miles southward. The channel, abreast Foul Bay, is about 2/5 mile wide between shoals on either side. It narrows to a width of 350 yards between reef extending from Steep Point, the northeast end of Spike Island and Brook Point, about 600 yards north-northwestward of Steep Point.

Andaman Strait bifurcates at a position about 1/2 mile eastward of Steep Point. Homfray Strait, the northern channel, separates Middle Andaman Island from Bara 8B-32. The south channel, which separates

the latter island from South Andaman Island, retains the name of Andaman Strait. That part of the channel, between Spike Island, on the west, and Stoa Island, Mangrove Island and Tala Kaicha Island, on the east, is known as Port Anson.

The south part of the west entrance of Andaman Strait, between Spike Island and the north end of South Andaman Island, about 600 yards southwestward, is fairly deep. It is, however, so narrow and intricate as to be regarded as dangerous.

APPROACHES TO PORT ANSON

8B-13 Foul Bay, on the north side of the main entrance of Andaman Strait, is reef strewn. The coast, between this bay and Brook Point, about 1 3/4 miles south-south-eastward, is fringed by a reef that extends about 350 yards offshore in places. Brooke Point rises to a rounded knoll, 316 feet high, about 250 yards northward of its extremity.

Foul ground extends nearly 1 mile southward from the west point of Foul Bay. Near the south end of this foul ground is a rock with less than 6 feet over it. Half-tide Rock, which dries 3 feet, lies about 3/5 mile southward of the same point.

Spike Island, the north side of which forms the south shore of the entrance channel, is covered with dense jungle. The island is 448 feet high at its north and 309 feet high at its south end. The north coast of the island, between Breaker Point and Steep Point, is fringed by a narrow reef, outside which a shoal, as defined by the 3-fathom curve, extends 350 yards offshore and up to 550 yards northwestward of the former point. A vessel drawing 15 feet reported grounding (1942) in a position 800 yards eastward of the same point. Braganza Ledge, located about 900 yards northwestward of Breaker Point, has a least depth of 4 1/2 fathoms over it.

The west side of Spike Island is fringed by a reef which in places extends up to 300 yards offshore. A spit, as defined by the 3-fathom curve, extends about 3/4 mile south-southwestward from Breaker Point. Its outer end lies about 700 yards offshore. Rocks, from 1 foot to 6 feet high, stand on the edge of the fringing reef. Long Rock, 4 feet high, is lo-

cated about 1 1/2 miles south-southwestward of the above point. Cinque Rocks, two groups of rocks, each 6 feet high, lie a little over 1/4 and 1/2 mile, respectively, southward of Long Rock.

Taylor Patches, located about 1 1/2 miles southwestward of Breaker Point, have a least depth of 4 3/4 fathoms over them. A shoal area, with depths of less than 10 fathoms and a least depth of 4 fathoms, lies about 1/2 mile west-southwestward of Long Rock.

Bluff Island, covered with trees, the tops of which are about 100 feet high, lies in the mouth of the south entrance channel, about 1/4 mile northward of the north end of South Andaman Island. The north end of the latter island is 287 feet high and cliffy. A drying reef extends 450 yards northward from the north end of the same island. A drying reef extends 1/4 mile westward and 1/2 mile northward from Bluff Island.

PORT ANSON

8B-14 PORT ANSON (12°16'N., 92°44'E.) lies between Spike Island, on the west, and Stoa Island, Mangrove Island, and Tala Kaicha Island, on the east. Depths of 7 to 11 fathoms are found in the clear spaces.

ISLANDS AND DANGERS.—Spike Island is described in section 8B-13. The east side of this island, which forms the west side of the port, is mostly steep-to, but some islets and drying reefs lie within 300 yards of the shore in places.

Stoa Island, the north point of which lies about 3/4 mile eastward of Steep Point, is 140 feet high. A very narrow drying reef fringes its west side and extends about 200 yards off its north and south ends.

Mangrove Island, located about 700 yards southward of Stoa Island, is fringed by a drying reef that extends up to 400 yards off its west side.

Tala Kaicha Island, the north part of which lies close eastward of Stoa Island and Mangrove Island, is fringed by a narrow drying reef. A detached reef lies 400 yards off the west side of Tala Kaicha Island and about the same distance south-southwestward of Mangrove Island. A detached rocky ledge, which dries 7 feet at high water springs, lies about 400 yards westward of the south end of Tala

Kaicha Island and within 1 1/4 miles southward of Mangrove Island.

Whales Reef lies about 3/4 mile northwestward of the south end of Tala Kaicha Island. Two reefs lie 400 and 800 yards, respectively, southward of Whales Reef.

ANCHORAGE.—Vessels can anchor in the north part of Port Anson in 9 to 10 fathoms, mud, about midway between Stoat Island and the north part of Spike Island.

DIRECTIONS—PORT ANSON.—The low mangrove point at the north end of Stoat Island, just open southward of Brook Point, bearing 112° leads through the channel northward of Spike Island. When within about 1/4 mile of Brook Point, vessels should alter course southward and keep in midchannel between Brook Point and Steep Point. After rounding the latter point at a distance of 200 to 400 yards, the course can be shaped for the anchorage.

DIRECTIONS—ANDAMAN STRAIT.—Vessels drawing 13 feet have navigated the strait. Small vessels with local knowledge should only attempt the passage during daylight hours, under favorable conditions. Such vessels should follow the directions above and steer southward in midchannel through Port Anson until westward of the south end of Mangrove Island. Thence the course should be altered slightly eastward until the summit of a conical peak, northward, is seen bearing 003° and just open eastward of the nearer hills that form the west side of a large mangrove valley. The course should then be shaped to about 183° and these marks kept on the bearing of 003°, astern. This course leads between the ledge of rocks that dries 7 feet, and Whales Reef and other reefs southward of it.

When the south end of Tala Kaicha Island bears 090°, the course should be altered to about 220° for the south point of Spike Island, giving a berth of about 600 yards to the east side of the strait until about 3/5 mile distant from the south point of Spike Island. Thence the course should be altered to pass 300 yards eastward of that point. When the same point bears 000°, the course should be altered southward to proceed along the west side of the strait, about 400 yards off the west shore.

When the west end of Baby Island (12°11'N., 92°44'E.), an island with two hillocks, located at the west end of the narrows in a position

about 3 miles south-southeastward of the south end of Spike Island, bears about 113°, the course should be altered to pass southward of that point and continue in midchannel through the strait.

Vessels should not attempt to pass through the narrows during the strength of the tidal streams at springs. Slack water occurs at the times of high and low water at Port Blair. The tidal currents are weak at neaps.

The east entrance of Andaman Strait is described in section 8B-39. A vessel drawing 13 feet has passed through the strait.

WEST COAST OF SOUTH ANDAMAN ISLAND

8B-15 Cape Bluff (12°12'N., 92°40'E.), the northwest end of South Andaman Island, is fronted by dangers to a distance of about 1 mile. The coast, between Cape Bluff and Petrie Island, about 15 1/2 miles south-southwestward, is clear of off-lying dangers, except for South Bank which is described in section 8B-3. The shoalest part of this bank lies about 15 miles west-northwestward of Cape Bluff.

PORT CAMPBELL

8B-16 PORT CAMPBELL, almost landlocked and affording good shelter, is entered between Petrie Island and Montgomery Island, about 1 3/4 miles south-southwestward. The cliffs in the vicinity of the port are yellowish-gray sandstone in which the stratum lines show plainly.

ISLANDS AND DANGERS.—Petrie Island, on the north side of the entrance, is connected by reefs and shoals to the northwest extremity of Defence Island, about 3 miles in length in a north-northwest and opposite direction, which partly forms the east side of the port.

A shoal, as defined by the 3-fathom curve, extends 1/2 mile southward from Petrie Island. A similar shoal fronts the west side of Defence Island. The latter shoal extends in a south-southwesterly direction for more than 1 1/2 miles from a position about 3/4 mile south-southeastward of the northwest end of Defence Island. Some rocks lie awash near the outer end of this shoal.

Montgomery Island, on the south side of the entrance, is connected to the mainland of

South Andaman Island by rocks both above- and below-water.

A shoal, as defined by the 3-fathom curve, fronts the west side of the port; its east edge extends in a northerly direction from a position about 1 mile south-southeastward of Montgomery Island to a position a little over 1/2 mile northeastward of the same island.

A detached patch, with depths of 5 to 6 1/2 fathoms, lies about 3/4 mile northeastward of Montgomery Island.

ANCHORAGES—DIRECTIONS.—Vessels can anchor in 12 fathoms in the entrance, in a position about 1,700 yards northeastward of Montgomery Island. Anchorage can be taken in 13 fathoms, a little over 1 mile southeastward of the same island.

Vessels can approach the latter anchorage in depths of not less than 10 fathoms by passing just northward of the 5-fathom patch on a 090° course until the west point of Petrie Island bears 000°. A course of 180° should then be steered until the north end of Montgomery Island bears 305°. Thence the course should be altered to 130° and anchorage taken when the northwest end of Defence Island bears 003°.

WEST COAST OF SOUTH ANDAMAN ISLAND (CONTINUED)

8B-17 The coast, between Montgomery Island and Palmer Point, about 15 miles southward, has not been closely examined. It appears, however, to have salient points fringed with reefs. An above-water rock stands near the south edge of the reef in a position about 1 mile southward of Palmer Point. A rocky bank, with depths of 3 1/4 to 8 fathoms, extends about 1 1/4 miles westward and about 2 miles south-southwestward from the above-water rock. A 3-fathom patch, the position of which is approximate, was reported (1964) to lie near the south end of the rocky bank.

Constance Bay, entered between Palmer Point and Florence Point, about 2 miles southeastward, is studded with reefs and islets and has not been closely examined.

PORT MOUAT AND APPROACHES

8B-18 PORT MOUAT is entered between Perseus Point and Andromeda Point, about

5/6 mile southward. Low wooded hills, the tops of which are about 100 feet high, stand close east-northeastward of the former point.

ISLANDS AND DANGERS.—Tarmugli Island, the northwestern island of the Labyrinth Islands, is 257 feet high. Frederick Point, its northwest extremity, is located 4 1/2 miles west-southwestward of Perseus Point. The southwest end of the island is cliffy and has two rocks, 15 feet high, close off it. A continuous reef fringes the north and west coasts of the island and extends as far as 1 1/4 miles off the latter coast.

A large area of foul ground extends up to 2 1/2 miles northward from the reef that fringes the north coast of the island. Allen Patches, a part of which is awash, lie on the outer part of this foul ground, about 2 miles northeastward of Frederick Point. A 3-fathom patch, the position of which is approximate, was reported to lie on the north end of the foul ground, about 2 1/2 miles northeastward of the same point. A channel, about 3/4 mile wide, lies between the north edge of this foul ground and the rocky bank (sec. 8B-17) that extends southward from Palmer Point.

A reef, on which there are numerous drying and sunken rocks, fronts the coast between Florence Point and Perseus Point, extending as far as 1 1/4 miles west-southwestward from the latter point.

Hooper Patch, having a least depth of 2 fathoms, lies close within the outer edge of the above reef in a position about 1 mile westward of Perseus Point.

A shoal, on the outer edge of which are rocks with less than 6 feet over them, extends about 3/4 mile westward from Andromeda Point.

The north shore of the port, for a distance of about 800 yards eastward of Perseus Point, is fronted by a reef that extends about 600 yards offshore. A drying spit extends about 300 yards south-southeastward from a position about 250 yards eastward of Perseus Point.

Andromeda Point and the south shore of the port, for a distance of about 1/2 mile eastward, is fronted by a reef somewhat similar to that fronting the north shore.

The entrance channel, between the reefs extending from each entrance point, is about 600 yards wide. Two patches, having depths of 2 1/4 and 2 1/2 fathoms, respectively, lie in the middle of the narrowest part of the

entrance. The channels northward and southward of these patches are about 200 yards wide; the depths are 6 to 10 fathoms.

The entrance channel, at a position about 1 1/4 miles eastward of the entrance, narrows to a width of about 300 yards and the navigable channel to about 100 yards. The depths increase somewhat. The harbor eastward of this narrow channel, opens out into a landlocked basin.

ANCHORAGES.—Small vessels with local knowledge can anchor in 4 to 5 1/2 fathoms in the landlocked basin.

DIRECTIONS.—Caution is required and the 2 1/4- and 2 1/2-fathom patches should be buoyed before entrance is attempted.

Vessels approaching from northward should steer for Frederick Point, keeping it bearing less than 180° until Perseus Point bears 102°. Thence a course of 102°, with Perseus Point ahead, leads between the rocky bank (sec. 8B-17) extending southward from Palmer Point and the foul ground extending northward from Tarmugli Island.

When Grub Island (sec. 8B-19), located about 2 miles south-southwestward of Andromeda Point, is in range with Mount Ford (sec. 8B-21), the course should be altered southward to keep these marks in range. This range leads between Allen and Hooper Patches. When the north entrance point of the narrow channel leading to the inner basin bears 086°, it should be steered for on that bearing. This bearing leads between the reef extending northward from Andromeda Point and the two shoal patches in the middle of the entrance.

Local fishing craft, approaching Port Mouat from southward, use Elphinstone Passage, a channel leading westward of Redskin Island and between Tarmugli Island and Grub Island. This channel has numerous dangers in its south approach and should be used only by small vessels with local knowledge.

LABYRINTH ISLANDS—NORTH SENTINEL ISLAND

8B-19 THE LABYRINTH ISLANDS, consisting of 14 islands and islets, lie off the southwest side of South Andaman Island. These islands are rocky and reef-fringed to a distance of 1 mile from their seaward faces. Large blocks of these projecting reefs have

been broken off by the sea during the Southwest Monsoon and have been blown onto the reefs, where they appear like rocky boulders. Tarmugli Island, the northwesternmost island of the group, has been described in section 8B-18.

Boat Island, 199 feet high and located about 1 3/4 miles southeastward of Tarmugli Island, is the southwesternmost island of the group. A reef projects about 1 mile southward from the island.

Malaytapu (Malay) Island, located about 2 1/4 miles eastward of Boat Island, is the southeasternmost island of the group. It has a rounded summit, 282 feet high, at its north end. A rocky ledge extends 1/4 mile from its south point.

Hobday Island, located close northeastward of Malaytapu Island, has a rocky ledge extending 1/2 mile southward from its southeast side towards the north point of Jolly Bay Island. A ridge, having depths of 3 1/2 to 4 1/2 fathoms, extends 1/2 mile farther southward from the end of this ledge.

Redskin Island lies with its south end close northwestward of Malaytapu Island. It is reported that Elphinstone Passage, which leads between the west side of the former island and Snob Island, is used by local fishing craft when proceeding to Port Mouat. Snob Island is 248 feet high and lies 3/4 mile westward of Redskin Island.

Pluto Island, small, rounded and 162 feet high, is located 1/2 mile eastward of Hobday Island. A rock, 2 feet high and said to be a useful mark at all stages of the tide, is located about 1/2 mile south-southeastward of Pluto Island.

Jolly Boys Island, 149 feet high, is located 3/4 mile northwestward of the northwest point of Rutland Island (sec. 8B-20). A reef, which is usually visible, fringes the island and extends about 3/4 mile southwestward from it.

Grub Island, 144 feet high and located about 1 1/2 miles eastward of the east end of Tarmugli Island (sec. 8B-18), has a yellow cliff on it.

NORTH SENTINEL ISLAND, located about 15 miles westward of Tarmugli Island, has been described in section 8B-4.

CURRENTS off the seaward side of the Labyrinth Islands are described in section 8B-5.

MACPHERSON STRAIT

8B-20 MACPHERSON STRAIT separates South Andaman Island and the Labyrinth Islands from Rutland Island. The recommended channel has a least depth of 4 fathoms and a least navigable width of 400 yards.

CHANNELS—DANGERS.—The west entrance is narrow and obstructed by reefs. Both shores of the strait are fringed with reefs, the edges of which are visible in places. The section of the strait, which lies between the southwest end of South Andaman Island and the northeast side of Rutland Island, is clear except for a rocky ledge which extends about 3/5 mile east-northeastward from the northeast point of the latter island.

Jolly Boys Island, which lies in the west part of the strait, has been described in section 8B-19. Several channels are found in the west approach to Macpherson Strait. Those leading between the islands forming the Labyrinth Islands are for the most part foul. The channel, between Malaytapu Island and Jolly Boys Island, which leads from Macpherson Strait to Elphinstone Passage (sec. 8B-19), is navigable by small vessels with local knowledge under favorable conditions.

Brooker Rock, a pinnacle with a depth of 5 feet, lies on the northwest side of the channel in a position about 4/5 mile west-northwestward of the southwest end of Jolly Boys Island. There are depths of 5 to 14 fathoms around this rock which is usually hidden by the discoloration of the water.

Beauchamp Patch, a small coral head, lies awash on the southeast side of the channel in a position about 2/5 mile north-northeastward of the northeast extremity of Jolly Boys Island. This patch is not always visible due to the discoloration of the water.

Peck Shoals are a group of coral heads located on the north side of the channel, the southernmost of which lies about 1 mile north-northeastward of the northeast end of Jolly Boys Island.

TIDAL CURRENTS.—The tidal currents in Macpherson Strait have been described in section 8B-5.

ANCHORAGE.—Vessels can anchor in 6 to 10 fathoms on the north side of the east part of the strait with Chiriya Tapu, the south end of South Andaman Island, bearing 125°, distant 1 1/2 miles. A white rock, which lies

on the north shore of the strait in a position about 1 1/4 miles north-northwestward of the above point, bears 058° and is reported to be a useful mark.

DIRECTIONS.—Vessels approaching Macpherson Strait from westward should, from a position at least 5 miles off the entrance, steer for Jolly Boys Island on a 051° course until the north end of Pluto Island bears 034°. Pluto Island will, in this position, be open 1/3 of its length eastward of the south-east side of Hobday Island. A 034° course will then lead about midway between Brooker Rock and the reef that extends southwestward from Jolly Boys Island. This reef is usually visible. When the summit of this island is abeam, the course should be altered to 052° with the 2-foot rock, located about 1/2 mile south-southeastward of Pluto Island, ahead. When the south end of Boat Island is seen just open southward of the south end of Malaytapu Island, bearing 265°, the course should be altered to 085° with that mark astern. This course leads between Peck Shoals and Beauchamp Patch.

The narrows can be passed through in midchannel. When the previously described 2-foot rock is abeam, the course should be altered so as to pass midway between Rifleman Islet and the northeast shore of the strait, whence a midchannel course can be steered through the remainder of the strait.

WEST SIDE OF RUTLAND ISLAND

8B-21 RUTLAND ISLAND, the southernmost of the Andaman Islands, is densely wooded. The north and south parts of the island are high; the two parts are connected by a low neck of land. Mount Ford (11°28'N., 92°39'E.) is 1,422 feet high and prominent. Mount Mayo, 744 feet high, is located in the south part of the island in a position about 5 1/2 miles south-southeastward of Mount Ford.

Woodmason Bay indents the west side of the island with its south part abreast the low neck of land. The north part is encumbered by reefs; its south part appears to be free from rocks and shoals outside a distance of about 600 yards offshore.

ISLANDS AND DANGERS.—A bank, as defined by the 10-fathom curve, extends about 4 miles westward from the southwest side of

the island. Twins Islands, level-topped and wooded, are located on the north side of this bank. East Twin Island is 144 feet high; West Twin Island is 157 feet high. A rocky ledge extends about 3/4 mile southwestward from the latter island. Turtle Rock, which dries about 6 feet, lies near the extremity of this ledge. A spit, as defined by the 5-fathom curve, extends about 3/4 mile southward from the rock. A 1 1/2-fathom patch lies near the extremity of this spit.

Investigator Rock, marked by rips and having a depth of 3 fathoms, lies nearly 1 mile south-southwestward of the south extremity of Rutland Island. A rocky shoal, with a least depth of 4 1/2 fathoms, lies about 600 yards north-northeastward of the rock.

OFF-LYING BANK.—An extensive bank of dead coral, having a least depth of 6 fathoms, lies centered in a position about 6 1/2 miles southwestward of the southwest extremity of Rutland Island.

NOTE.—The east side of Rutland Island is described in section 8B-56. Manners Strait and the islands and passages southward of Rutland Island are described in section 8B-57.

EAST SIDE OF NORTH ANDAMAN ISLAND

8B-22 COAST.—Cape Price (13°35'N., 93°02'E.), the northeast point of North Andaman Island, has been described in section 8B-7. Between the cape and the entrance of Gibb Creek, about 7 miles southward, the coast is fronted by several rocky patches. Passing vessels should keep at least 2 1/2 miles off this coast.

OFF-LYING DANGER.—Union Ledge lies nearly awash in a position about 6 1/2 miles eastward of Popcock Island. It forms the south limit of an extensive bank, on which the depths are less than 20 fathoms and irregular, that extends east-southeastward from East Island (sec. 8B-1). A shoal, with depths of 6 to 8 fathoms, lies about 3 4 mile eastward of the ledge. A 3-fathom patch lies about 1/2 mile southwestward of this ledge.

ISLAND AND DANGERS.—Popcock Island, 244 feet high and wooded, is located about 1 3/4 miles south-southeastward of Cape Price. Foul ground, at the south end of which there is a rock, awash, extends about 1/4 mile southward from the island. A rock,

which dries 4 feet, lies 1/4 mile farther southward.

A shoal, with a least depth of 3 fathoms, lies 1 1/4 miles offshore in a position about 4 miles southward of Popcock Island.

Beauchamp Reef, which is awash, lies nearly 1 mile off the coast, in a position about 6 1/2 miles southward of Popcock Island.

CADELL BAY is entered between the south entrance point of Gibb Creek and Colvin Point, about 2 3/4 miles southeastward. Trilby Island, 1,257 feet high, lies about 400 yards east-northeastward of Colvin Point. Tree Island, 45 feet high and having some low trees on it, lies about 600 yards east-northeastward of the north point of Trilby Island. The passage between the two islands is foul, with a drying rock in midchannel. Vessels can anchor, during the Southwest Monsoon, in 6 to 7 fathoms, mud, in the middle of the bay.

BOND HARBOR is entered between Tree Point, located about 1 mile south-southeastward of Colvin Point, and the south end of Trilby Island, about 800 yards northward. A spit, as defined by the 3-fathom curve, extends about 1/4 mile northward from Tree Point. Small vessels can **ANCHOR** in the middle of the harbor in 7 to 8 fathoms, sand and mud. The harbor is sheltered except from the northward.

TABLE ISLANDS AND ADJACENT DANGERS

8B-23 EXCELSIOR ISLAND (13°26'N., 93°07'E.), located about 1 1/2 miles eastward of Trilby Island (sec. 8B-22), is covered with trees. A reef fringes its northeast side to a distance of 600 yards. There is a sandy beach on its southwest side. A shoal, with a least depth of 2 1/2 fathoms, lies nearly 1 mile northeastward of Excelsior Island.

Delgarno Island, located about 3/4 mile south-southwestward of Excelsior Island, has a clear sandy beach on its northwest side. Mangroves are found on its east and south sides. A reef fringes its south side to a distance of about 2/5 mile.

The above islands stand at the northwest and southwest ends, respectively, of an extensive shoal over which the depths are less than 3 fathoms. Foul ground extends about 1 mile southeastward from Excelsior Island, and about 1 1/4 miles eastward from Delgarno Island. Irregular depths extend about

1 1/4 miles eastward from the former island and about 1 3/4 miles eastward from the latter island.

North Passage Reef, which dries about 8 feet, lies about 1/2 mile westward of Excelsior Island. The passage between this reef and Tree Islet (sec. 8B-22), about 900 yards westward, is clear of dangers.

Mushroom Reef and Table Reef lie about 300 yards apart in a position about 1 3/4 miles eastward of the south end of Delgarno Island. Each dries 4 feet, they are usually visible.

South Passage Reef, which dries 8 feet, lies in the south entrance of the passage between the Table Islands and North Andaman Island. A shoal spit extends about 800 yards east-southeastward from the reef. Vessels using this passage should pass westward of this reef.

CAUTION.—Vessels passing eastward of the Table Islands should keep outside the 20-fathom curve.

COASTAL FEATURES (CONTINUED)

8B-24 From Tree Point, the coast trends southwestward for about 1 3/4 miles to the entrance of Thoroughfare Creek. This narrow boat channel separates Smith Island from the east coast of North Andaman Island and leads into Port Cornwallis (sec. 8B-25).

ISLANDS AND DANGERS.—Smith Island attains a height of 431 feet and has a conspicuous tree on its summit. Mangrove Point (Cape Bayett), the easternmost point of Smith Island, is located 3 1/2 miles southeastward of the entrance of Thoroughfare Creek. This bluff point is fronted by a drying reef that extends about 400 yards offshore. A 5 1/2-fathom patch lies about 7/10 mile southward of Mangrove Point.

Temple Island is wooded and lies about 1/2 mile northeastward of the north end of Smith Island, which forms the south entrance point of Thoroughfare Creek. A shelving reef extends about 1/4 mile from the east side of Temple Island. A rocky ledge, which dries about 8 feet, lies about 700 yards eastward of the same island.

Turtle Islands, two in number, wooded and about 150 feet high, are located about 1 3/4 miles north-northwestward of Mangrove Point. A fringing reef surrounds each island. There is a sandy beach on the northwest side

of the southwest island. Turtle Reef, in the middle of which is a sandbank, 4 feet high, lies about 1/2 mile northward of the island. A 4-fathom shoal lies 1/2 mile east-southeastward of the reef.

The CHANNEL between the Turtle Islands and the east side of Smith Island is from 600 to 800 yards wide and is clear; the depth is not less than 11 fathoms.

BACK BAY, an open bight, lies between Mangrove Point and Ross Island, about 2 miles southward. The shores of the bay are fringed by reefs. Back Bay Shoal, having a least depth of 1 fathom and located about 1 mile southeastward of Mangrove Point, lies in the approach to the bay and breaks only in heavy weather. Back Bay Reef, about 1 mile southward of Mangrove Point, dries 5 feet. It is usually visible at high water, except when the sea is very smooth. Depths of 6 to 8 3/4 fathoms exist between Back Bay Shoal and Back Bay Reef.

CLEARING MARKS.—Tree Island (sec. 8B-22) in range with Cape Price (sec. 8B-22) bearing 341° leads eastward of Back Bay Shoal. Hand Peak (sec. 8B-25) in range 235° with the southeast side of Ross Island leads southeastward of the same shoal.

PORT CORNWALLIS

8B-25 PORT CORNWALLIS is entered between Ross Island and Dundas Point, about 1 3/4 miles south-southwestward. Ross Island, 271 feet high, is connected to Smith Island by a sandy spit and is almost entirely surrounded by a drying reef. Dundas Point is sharp and rocky and is fronted by a drying reef that extends about 350 yards north-northeastward from its extremity. The point rises to a height of 407 feet about 2/5 mile southward of its extremity. Hand Peak, 719 feet high, is a sharp wooded hill located 2 3/4 miles west-southwestward of the same point. A 605-foot peak stands about 1 mile southwestward of Dundas Point.

DEPTHS.—There are considerable depths in the entrance and in the harbor. The west part of the harbor is very shallow, but a narrow channel, as defined by the 3-fathom curve, leads between Wharf Island and South Island, and thence southwestward into Blair Bay, an extensive, but shallow backwater, surrounded by mangroves.

DANGERS.—Shoal ground, as defined by the

5-fathom curve, extends almost 1/2 mile eastward, and a little over 1/4 mile southward from Ross Island. North Reef, which dries about 8 feet, lies about 750 yards southeastward of the island. A 2 3/4-fathom patch lies close southeastward of the reef.

A shoal patch, with a least depth of 3 3/4 fathoms, lies a little over 1/2 mile east-northeastward of Dundas Point.

South Reef, which dries about 8 feet, lies about 800 yards eastward of Dundas Point. Middle Rock, which also dries about 8 feet, lies the same distance south-southeastward of the same point.

Depths of 3 1/2 and 6 3/4 fathoms lie about 1 1/4 miles and 1 3/4 miles, respectively, southward of Dundas Point. A 4-foot shoal lies about 1 mile southward of the same point. Shoals with depths of 2 3/4 to 5 1/4 fathoms lie between Middle Rock and the 3 1/2-fathom patch.

BAYS-ISLANDS.—Minerva Bay is entered between Hood Point, the south extremity of Smith Island, and Perseverence Point, about 1 3/4 miles northwestward. A bank, as defined by the 10-fathom curve, extends about 3/4 mile southeastward from the latter point, about halfway across the entrance of the bay. A large rocky shoal, with depths of 5 3/4 to 9 fathoms, lies on the outer edge of this bank. A 7 3/4-fathom patch lies nearly 3/4 mile northwestward of Hood Point.

Brush Islet, composed of broken coral and stones, has some trees, the tops of which are 20 feet high. It lies nearly in midchannel in a position about 1 mile southwestward of Hood Point. The islet is surrounded by reef. A shoal spit, with depths of 3 feet to 6 fathoms, extends about 1 mile westward from Brush Islet. A rock, that dries 8 feet, lies about 200 yards southeastward of the islet. A depth of 6 1/4 fathoms lies about 1/3 mile west-northwestward of Hood Point.

Atalanta Bay is entered between Dundas Point and Barkely Point, about 1 1/4 miles west-northwestward. A shoal area with depths of 1 1/4 to 6 fathoms, lies in the middle of the bay, just within the 10-fathom curve.

Chatham Island, 200 feet high near its south end and 190 feet high near its north end, is covered with jungle.

Jungle Island (Low Islet) is located on the north side of the harbor, in the south entrance

of Thoroughfare Creek, about 1 mile northward of Perseverence Point. North Island lies about 1 mile westward of Jungle Island. Wharf and South Islands, 159 and 119 feet high, respectively, lie about 400 yards and 1/2 mile westward, respectively, of the south end of North Island. Shoal patches with a least depth of 3 3/4 fathoms, lie between North Island and Chatham Island.

ANCHORAGES.—During the Southwest Monsoon, vessels can anchor in the entrance of Atalanta Bay. The best anchorage is northeastward of Chatham Island, in 6 to 8 fathoms, mud, about midway between the south end of that island and Jungle Island. Anchorage is also afforded in 12 to 13 fathoms, about 1 mile northwestward of Brush Islet.

DIRECTIONS.—Vessels entering Port Cornwallis should keep Brush Island bearing 287° and in range with South Point, the south end of Chatham Island. When the northeast end of the latter island bears 313° and is in range with the southwest end of Wharf Island, the course should be altered to that bearing. This range leads up the harbor. When abreast Perseverence Point, the course can be altered to northward for the anchorage.

COASTAL FEATURES (CONTINUED)

8B-26 The coast, between Dundas Point (sec. 8B-25) and Cadell Point, about 15 miles south-southwestward, is not well charted. Craggy Island, about 3 miles southward of the former point, is connected to its east coast of North Andaman Island by a reef. Small vessels with local knowledge can obtain good ANCHORAGE off the south side of this reef.

Taralait Bay is a slight indentation in the coast and is located 9 miles southward of Craggy Island.

Saddle North Peak and Saddle Hill, which are prominent, have been described in section 8B-8.

STEWART SOUND

8B-27 STEWART SOUND, which contains several bays and inlets, lies within Sound Island, between Cadell Point and Cape Vestal. The hills surrounding the sound are covered

with dense jungle. Sound Peak (White Mountain), located about 2 miles west-southward of Cape Vestal, is 1,184 feet high and covered with dense jungle. The peak stands at the north end of the eastern coastal range of Middle Andaman Island. Ray Hill, a conspicuous cone-shaped hill, 445 feet high, is located about $5 \frac{2}{3}$ miles southwestward of Cadell Point. The hill serves as a good mark for vessels approaching the south entrance of the sound. Ridges of high land traverse Sound Island in all directions and are prolonged in spurs up to the entrance points of the numerous bays that indent the island. The coasts of the island are lined by a belt of mangroves and by reefs; there are a few sandy beaches.

Stewart Sound is of great extent and is the principal port of North Andaman Island. Large timber felling operations are centered at a settlement known as Mayabunder (Bonington), located around Takla Oyster (Kwangtung) Point, on the southwest side of the sound. Forest camps and settlements are found around the shores of the sound.

Austin Strait, which separates North Andaman Island from South Andaman Island, has its east entrance at the head of a shallow bay on the south side of Stewart Sound.

TIDAL CURRENTS.—The tidal currents set northward on the rising tide and southward on the falling tide. They attain a spring rate of $1 \frac{1}{2}$ knots in the narrow parts of the sound. The northgoing current attains a rate of $\frac{1}{4}$ knot, and the southgoing current a rate of 2 knots, southward of Comp Bay, a small bight on the north side of the north entrance. The tidal currents close northward of Takla Oyster (Kwangtung) Point set southwestward on the rising tide and northeastward on the falling tide. During the strength of the Southwest Monsoon, the southwestgoing current is very weak, but the northeastgoing current attains a rate of 2 knots.

SOUND ISLAND is an irregularly-shaped island lying in the entrance of Stewart Sound. Rocks, both above water and sunken, extend about $\frac{1}{2}$ mile northeastward from Simpson Point, the northeast end of the island. Mitchell Point, the southeast extremity of the island, is fringed by a drying reef that extends $\frac{1}{3}$ mile south-by-westward from it. Square Rock, 14 feet high and prominent, stands on the west side of the outer part of the reef. Jones Point, the southwest extremity of

Sound Island, is fringed by a drying reef on which there is a ridge of rocks extending 800 yards southward to southeastward. A rock, that dries 8 feet, lies near the end of this ridge.

8B-28 NORTH ENTRANCE—ISLANDS AND DANGERS.—The north entrance of the sound lies between Cadell Point and Simpson Point. Elphin Patch, which lies near the middle of the entrance, has a depth of less than 6 feet near its center. Morland Rock, which dries 8 feet, lies about 800 yards southwestward of Cadell Point. Shoal ground, with a least depth of $2 \frac{1}{2}$ fathoms near its outer end, extends about 600 yards south-southeastward from the rock.

Oliver Island, 195 feet high, lies about 1 mile westward of Simpson Point. The north and east sides of the island are fringed by reefs and shoals that extend as far as 350 yards northward from the island. Its southwest side is rather steep-to and there are considerable depths in the channel between it and Sound Island.

Sunk Reef, which dries 2 feet and which has a 3-fathom patch on its northwest side, is located about $\frac{3}{4}$ mile northwestward of Oliver Island.

A group of rocks, which dry 8 feet, lie about 1 mile westward of Oliver Island. Shoal ground, as defined by the 5-fathom curve, extends about 550 yards southwestward from the group.

Oyster Island, 4 feet high, is located about $\frac{3}{4}$ mile west-southwestward of Oliver Island.

Stewart Island, located in a shallow bay on the northwest side of the sound, is covered with jungle. A drying mudbank connects the northwest side of Stewart Island with North Andaman Island.

Marsack Shoals consist of two small patches that lie at the south end of the channel between Sound Island and North Andaman Island. The eastern patch has a least depth of $3 \frac{1}{4}$ fathoms and lies $\frac{1}{2}$ mile northwestward of Jones Point. The west patch has a least depth of $1 \frac{1}{2}$ fathoms and lies $\frac{5}{6}$ mile west-northwestward of the same point.

8B-29 SOUTH ENTRANCE—ISLANDS—DANGERS.—The south entrance of the sound lies between Mitchell Point and Cape Vestal,

about 5 miles south-southwestward. Five Fathom Patch, a rather large shoal, lies nearly in the middle of the south entrance. Convict Patch, a shoal over which the depths are less than 3 fathoms, lies about 1 mile northward of Cape Vestal. Some rocks, with depths of less than 6 feet, stand on the shoal. A 6-fathom shoal lies about 2 miles east-northeastward of the same point.

Aves Island is located about 2 miles south-westward of Sound Island. A coral reef, that dries in places, connects the island with Aves Point, about $\frac{3}{4}$ mile west-southwestward.

Takla Oyster (Kwangtung) Point, about $1\frac{1}{2}$ miles west-northwestward of Aves Point, is the north extremity of a promontory which forms the east side of a shallow bay. The east entrance of Austin Strait is located at the head of this bay.

A shoal, with a least depth of $1\frac{3}{4}$ fathoms, lies nearly $\frac{1}{2}$ mile eastward of Takla Oyster Point. A white conical BUOY marks this shoal.

Berkeley Group consists of Orchid, Curlew, Egg, and Dottrel islands which lie in the approach to Bacon Bay, westward and north-westward of Takla Oyster Point. All except Dottrel Island are identifiable from abreast Square Rock. Orchid Island, 171 feet high, is covered with trees and jungle. A reef extends about 200 yards southeastward from it. Egg Island is 106 feet high and densely wooded. Several prominent trees and some wooden huts stand on Curlew Island. These together with a red-roofed bungalow on its northeast side, make the island identifiable. Curlew Island is 171 feet high.

A shoal, having a depth of 7 fathoms, lies nearly 600 yards southward of the south end of Orchid Island. A rock, that uncovers 7 feet, lies $\frac{1}{4}$ mile westward of Curlew Island. A shoal spit, with depths of $4\frac{1}{4}$ to 8 fathoms, extends about $\frac{3}{5}$ mile northwestward from the northwest end of Orchid Island.

BACON BAY is entered between Brown Point and Orchid Island, about $\frac{3}{4}$ mile west-southwestward. The former point is covered with trees and jungle. The bay is sheltered from all winds, and its east part is clear of dangers outside a distance of about 400 yards offshore.

A shoal, with a depth of $7\frac{1}{4}$ fathoms, lies in midchannel in a position about 750 yards southwestward of Brown Point.

8B-30 ANCHORAGES.—Vessels can anchor in suitable depths in any part of Stewart Sound. Anchorage can be taken in Bacon Bay at all seasons.

Anchorage are indicated on the chart on the north side of the north entrance, about $\frac{9}{10}$ mile northward of Oliver Island, in 8 to 9 fathoms, and in the channel between Sound Island and North Andaman Island, about 2 miles northward of Jones Point. These anchorages are partially open to the northeastward.

Vessels calling at Mayabunder settlement can anchor in 10 fathoms, mud, with Egg Island bearing 272° , distant $\frac{1}{2}$ mile, and the south point of Orchid Island bearing 023° . Small vessels with local knowledge can anchor farther westward, off Dottrel Island. CAUTION is required.

Vessels can find sheltered anchorage in 12 to 14 fathoms near the head of Bacon Bay. Anchorage can be taken about 800 yards off the east shore with Ray Hill bearing 095° .

DIRECTIONS.—Vessels coming from northward and intending to enter by the south entrance should round Square Rock at a distance of about $\frac{3}{4}$ mile, and thence should steer for Orchid Island on a bearing of 284° .

Vessels proceeding to the anchorage near the settlement of Mayabunder should follow the above directions until Egg Island bears 272° . Thence a course of 272° leads to this anchorage. Caution is required in keeping Egg Island bearing not more than 272° until well clear of the $1\frac{3}{4}$ -fathom shoal located eastward of Takla Oyster Point.

Vessels wishing to anchor in Bacon Bay should round Square Rock at a distance of $\frac{3}{4}$ mile, keeping Orchid Island bearing 284° until the summit of Aves Island bears 135° . Thence a course of 315° , with Aves Island astern, leads into Bacon Bay, passing midway between Orchid Island and Brown Point. This course leads across the before-mentioned $7\frac{1}{4}$ -fathom midchannel shoal. When the summit of Ray Hill bears 050° , the course can be altered northward for the anchorage at the head of the bay.

Vessels coming from southward should keep Ray Hill bearing 322° and just open southwestward of Jones Point, until Orchid Island is seen about midway between Aves Island and Jones Point, and bearing 287° . The

directions given for vessels coming from northward should then be followed.

MAYABUNDER.—The settlement of Mayabunder stands on Takla Oyster Point. A conspicuous white house, with a red roof, stands on the east side of the promontory, about 250 yards south-southeastward of the north end of the point. Two conspicuous trees, the highest attaining an elevation of 220 feet, stand about 600 yards southward of the conspicuous white house. The ruins of a large sawmill is located on the northwest side of the point.

The District Forestry Officer, who is the local administrative authority, resides at Mayabunder in the before-mentioned conspicuous white house.

A wooden jetty extends about 60 feet west-northwestward from the west side of the promontory, about 200 yards south-southwestward of the north end of Takla Oyster Point. In 1952 there was a least depth of 8 feet alongside its head. Some pilings lie close off the coast, between this jetty and the sawmill ruins.

Provisions in very limited quantities can be obtained.

EAST COASTS OF MIDDLE ANDAMAN ISLAND AND BARATANG ISLAND

8B-31 The coast, between Cape Vestal and Cape Strachan, about 9 miles south-southeastward, is high. The latter point forms the north entrance point of Cuthbert Bay. Mount Diavolo, 1,678 feet high, is located about 3 1/2 miles westward of the same point. Between Cuthbert Bay and Coxon Point, about 13 miles southward, the coast continues to be high.

RONGAT BAY is entered between Coxan Point (12°29'N., 92°58'E.), which is bold and bluff, and Johns Point, about 3/4 mile southward. A rock, that dries 4 feet, lies about 3/4 mile east-northeastward of Coxon Point. Shoals, with depths of 1 3/4 to 5 1/4 fathoms, extend about 1/2 mile northward from a position about 3/4 mile south-southeastward of its drying rock. Shoals, the outermost of which has a depth of 4 fathoms, extend about 2 1/4 miles eastward from the same point. Johns Point is also bold and bluff and is relatively steep-to, except on its southeast side, where a

reef, the outer end of which dries 4 feet, extends about 1/2 mile southeastward.

ANCHORAGE can be taken in 3 1/2 to 5 fathoms between the entrance points of Rongat Bay. Local knowledge is required as the bay shallows rapidly within the entrance points. The head of the bay is lined with mangroves and fringed by a drying reef.

COAST.—Between Johns Point and a 384-foot promontory on Baratang Island, about 17 miles south-southwestward, the coast is fronted by many islands and dangers; it is deeply embayed. Between the promontory and North Point, the southeast point of Baratang Island, about 9 miles southwestward, the coast is indented by many reef-fringed bays. This stretch of coast is fringed with reef on which mangroves grow, and is backed by hilly country. North Point (sec. 8B-39) forms the north side of the south entrance of Andaman Strait.

ISLANDS AND DANGERS.—**LONG ISLAND**, which is densely wooded, is the northernmost of a chain of islands, reefs, and rocks which extends southward for about 15 miles from a position about 2 1/2 miles southward of Johns Point. The islands are separated from each other, and from Middle Andaman and Baratang Islands, by mostly narrow and shoal channels. The bays and inlets thus formed are intricate and studded with shoals and dangers. Small vessels with local knowledge can find shelter in some of these bays. Elphinstone Harbor, which affords sheltered anchorage, lies close to the east entrance of Homfray Strait, which separates Middle Andaman and Baratang Islands, and is located about 8 1/2 miles south-southwestward of the north end of Long Island.

Reefs and shoals extend up to 700 yards off the north, east and south sides of Long Island. Its west coast is joined to Middle Andaman Island by a shallow flat.

GUITAR ISLAND, which lies about 3/4 mile south-southwestward of Long Island, is fringed by reef and is joined to Middle Andaman Island by a shallow flat. Foul ground extends about 1/4 mile from its east side. Cape Dalrymple forms the south end of an islet, 246 feet high, located close southward of Guitar Island. Round Island, 155 feet high, lies about 200 yards westward of the southwest end of Guitar Island.

A shoal, with a least depth of 9 feet, lies with its south extremity about 3/4 mile south-southeastward of Cape Dalrymple. A patch, with a depth of 25 feet, lies about 1 mile south-southeastward of the same cape.

Nancowry Ledge, which lies about 1 1/4 miles eastward of Cape Dalrymple, has depths of less than 6 feet.

8B-32 OFF-LYING DANGERS.—Anderson Rock, which dries about 1 foot, lies 1 mile eastward of the north end of Long Island.

Campbell Shoal, located about 5 miles eastward of Anderson Rock, has a least depth of 3 fathoms, rock. It lies on the east side of a bank, which has depths of 9 to 20 fathoms and extends 2 1/2 miles southward from a position about 5 1/4 miles east by northward of the north point of Long Island.

Headlam Patch, located about 1 1/2 miles off the east side of Long Island in a position about 2 1/2 miles south-southeastward of the north point of Long Island, has a least depth of 2 fathoms, rock.

An extensive shoal, with a depth of 2 1/2 fathoms near its southwest end, and 4 1/2 fathoms near its northeast end, lies between 5 1/4 and 7 3/4 miles eastward of Cape Smith, the south point of Long Island. A detached shoal, with a least depth of 2 fathoms, lies about 1 mile south-southeastward of the southwest end of the extensive shoal. The islands and dangers southward of the shoal are described with Ritchies Archipelago in section 8B-34 and 8B-35.

Ostmaston Shoal, with a least depth of 10 feet, lies about 1 3/4 miles eastward of Cape Smith.

ISLANDS AND DANGERS.—North Passage Island is irregular in shape, high and wooded. Cape Portman is the extremity of a narrow promontory forming the northeast end of the island. The cape is located about 2 miles southeastward of Cape Dalrymple. The east side of the island is fronted by foul ground of coral heads and shoal patches, which extend from 1 mile to 2 3/4 miles offshore. Balfour Reef extends about 1 mile northward from the northwest end of the island. It lies nearly 1 mile westward and parallel to the promontory forming Cape Portman. Merk Bay, which lies between the promontory and Balfour Reef, has depths of 11 to 15 fathoms.

Strait Island lies about 3/4 mile south-southeastward of North Passage Island. The channel between the islands is foul. The north and east sides of Strait Island are fringed by reefs. Shoals and foul ground, with depths of less than 5 fathoms, extend up to 2 miles eastward from the island. Cross Point, its south end, is narrow and from it shoals with depths of 1 fathom to 4 1/2 fathoms extend about 1/2 mile in a south-southwesterly direction.

Colebrooke Island lies westward of the south part of North Passage Island.

TIDAL CURRENTS in the channel between Long and Guitar islands, in the approach to Elphinstone Harbor, and at the various anchorages are weak. They become somewhat stronger, however, after consistent easterly winds. Strong tidal currents, with many eddies, are experienced in Homfray Strait.

CHANNELS.—A channel, having depths of 3 1/2 to 20 fathoms, leads between Long Island and Guitar Island to a position about 1/2 mile westward of a wooden jetty, located about 1 mile westward of a wooden jetty, located about 1 mile northwestward of the southeast extremity of Long Island. There is a deep hole of 20 fathoms in the entrance. A narrow channel, having depths of 3 1/2 to 7 fathoms, leads from the position off the jetty in a north-northwesterly direction for about 2 1/2 miles to the entrance of several shallow creeks that extend into the interior of Middle Andaman Island.

Homfray Strait, an intricate and rocky channel, connecting Elphinstone Harbor (sec. 8B-33) with Port Anson (sec. 8B-14), separates Middle Andaman Island from Baratang Island. Depths in the fairway are not less than 2 3/4 fathoms, except near the east entrance where the depth over the broad bar is very shoal and consists of broken shells, sand and gravel.

The channel between North Passage Island and Strait Island is shallow and obstructed.

The channel between North Passage Island and Colebrooke Island is 900 yards wide and has depths of 3 to 10 fathoms. It is encumbered with reefs and shoals and can be used only by small vessels with local knowledge.

Colebrooke Passage is 400 yards wide and has depths of 4 to 10 fathoms, except in its north part which is shallow.

ANCHORAGES.—Vessels can anchor about 700 yards southwestward of the before-mentioned jetty in 4 1/2 fathoms, broken shells. The swinging room is limited to about 400 yards.

Vessels can anchor in a position about 1 1/3 miles westward of Cross Point in 13 fathoms, good holding ground.

Vessels can obtain well sheltered anchorage in 8 1/2 fathoms, good holding ground, near the south end of Colebrooke Passage, with Cape Union, the southeast extremity of Colebrooke Island in range 065° with the center of Middle Button Island (sec. 8B-34). The space available, with depths of over 3 fathoms, is about 500 yards in diameter.

Anchorage can be taken in Horsford Bay in 4 to 5 fathoms in a position about 4 miles south-southwestward of the south entrance of Colebrooke Passage.

SETTLEMENT.—A forest camp, with a sawmill and small workshop, is located a little over 3/4 mile west-northwestward of Cape Smith, the southeast extremity of Long Island. A wooden jetty extends from the southwest side of Long Island at a position about 800 yards northward of the camp. A trolly connects the jetty with the camp. There are reported depths of 8 to 10 feet alongside the jetty.

ELPHINSTONE HARBOR

8B-33 ELPHINSTONE HARBOR is entered between Cape Dalrymple and Cape Portman, about 1 3/4 miles southeastward. The harbor is formed by the north part of the channel which separates North Passage Island from the east side of Baratang Island. The 388-foot hill, located on the north entrance point of Homfray Strait, about 2 miles west-southwestward of Cape Dalrymple, serves as a useful mark. A prominent tree, with an elevation of 320 feet, stands on Guitar Island.

DEPTHS of about 15 fathoms are found in the middle of the entrance. Depths of 8 to 11 fathoms are found within the entrance, but there are numerous reefs and shoals within the harbor, the positions of which can best be seen on the chart. The dangers in the approach and in the entrance have been described in section 8B-32.

Mills Passage, between the south part of North Passage Island and Colebrooke Island, has a least width of 900 yards and depths of 3 to 10 fathoms. Numerous shoals and reefs lie in the passage which is used only by small craft with local knowledge.

BUOYS.—A red conical buoy, moored about 1 1/4 miles westward of Cape Portman, marks the north end of Balfour Reef.

A yellow conical buoy, moored about 1 mile southwestward of the northwest point of North Passage Island, marks the northeast edge of a detached reef close off the east side of Baratang Island.

These buoys were reported missing (1964).

ANCHORAGES.—Anchorage can be taken in 10 fathoms, good holding ground, about 600 yards off the coast of North Passage Island, with the northwest point of that island bearing 029°, distant 1,100 yards.

Anchorage can be taken in about 9 1/2 fathoms, mud and broken shells, with Cape Portman bearing 090°, distant 2 miles.

DILIGENT STRAIT

8B-34 DILIGENT STRAIT lies between North Button, Middle Button, and Strait Islands, on the northwest, and Outram, South Button, and Wilson Islands, on the southeast.

DEPTHS.—The least depth near the fairway of the strait is 5 1/2 fathoms, about 2 miles east by southward of the south end of Strait Island. A depth of 6 3/4 fathoms was reported (1962) about 1 1/2 miles southwest by south of Strait Island.

TIDAL CURRENTS.—See section 8B-5.

ISLANDS AND DANGERS.—North Button Island, located about 7 1/2 miles eastward of the north point of North Passage Island, is 207 feet high and terminates in low, irregular cliffs at the east point. The west part of the island descends abruptly to a spit of sand, covered with trees. Shoal ground, as defined by the 5-fathom curve, extends about 9/10 mile eastward and 3/10 mile westward from the island. The north side of the island is clear of dangers, but the bottom is rocky. The east end of the island should not be approached within 1 1/2 miles, and the west end within 3/4 mile in those directions.

Middle Button Island (12°17'N., 93°02'E.) is 164 feet high and lies about 3 miles south-

westward of North Button Island. The north end of the island is cliffy, but the southwest point terminates in a short sandspit, with a few low rocks off it. Shoals, with depths of 2 1/2 to 4 1/2 fathoms, extend about 1 1/2 miles north-northeastward from the north end of this island. A ridge of rocks and shoal ground extends about the same distance southwestward from the island.

North Button Island bearing 037° and open eastward of Middle Button Island leads south-eastward of the shoals extending southwestward from the southwest end of the latter island.

Outram Island, located 3 1/4 miles southward of North Button Island, is described in section 8B-35.

South Button Island, located about 3 miles southward of Middle Button Island, is 118 feet high and formed of large rocks, steep to all around. A rocky head, with a depth of 5 1/2 fathoms, lies about 1 mile eastward, and a coral patch, with a depth of 1 3/4 fathoms, lies about 1 mile southeastward of the island.

Two Fathom Rock lies about 1 mile northward of the north extremity of Wilson Island (sec. 8B-35). The north point of Nicholson Island (sec. 8B-35) bearing 192° and open westward of the west side of Wilson Island, leads westward of this rock.

ANCHORAGES.—Small vessels with local knowledge can anchor close off the reef fringing the south side of North Button Island. Such vessels can also anchor southward of Middle Button Island, clear of the shoals.

DIRECTIONS.—Vessels from northward should shape course, from a position about 2 miles eastward of North Button Island, to pass about 1/2 mile northwestward of South Button Island. When that island bears about 135°, the course should be altered southward until the south side of that island is in range with the northwest extremity of Outram Island, bearing 055°. This range should be kept astern on that bearing until the north point of Nicholson Island (sec. 8B-35) is seen open westward of the west end of Wilson Island, bearing about 192°. The course can then be altered to pass about 1 1/2 miles westward of the latter island.

Vessels approaching from the southward should steer for Strait Island until the south side of South Button Island is in range 055° with the northwest extremity of Outram Is-

land. This range should be steered for until the east end of Middle Button Island bears 022°. Thence the course should be altered to pass northwestward of South Button Island and midway between Middle and North Button Islands and Outram Island.

RITCHIES ARCHIPELAGO

8B-35 RITCHIES ARCHIPELAGO consists of 10 islands lying between the parallels of 12°16'N. and 11°47'N. The north end of the group is separated from Baratang Island by Diligent Strait (sec. 8B-34). The islands of the archipelago are densely wooded.

TIDAL CURRENTS are described in section 8B-5.

OUTRAM HARBOR.—Outram Island (12°15'N., 93°06'E.) is the northern island of the archipelago. The island is fringed by a reef, except on its west side. Outram Harbor is a deep indentation in the north coast of the island. Some low rocks lie on the reefs that fringe West Point, the west entrance point of the harbor. Shoal ground, as defined by the 5-fathom curve, extends 3/4 mile northeastward from this point, and 3/5 mile north-northeastward from East Point, the east entrance point of the harbor.

Outram Harbor affords good shelter from southerly winds. Small vessels with local knowledge can anchor in 10 fathoms near the middle of the harbor, with the north end of Middle Button Island (sec. 8B-34) in range with West Point, bearing about 290°.

NORTHWEST SIDE OF RITCHIES ARCHIPELAGO.—Charka Juru is the strait that separates Outram Island from Henry Lawrence Island to the southward. It has considerable depths throughout. Shoal ground, with coral heads, extends about 1 mile southward from South Point, the south end of Outram Island. The course through the strait, after clearing these dangers, is in midchannel.

The west side of Henry Lawrence Island rises steeply to a ridge, 567 feet high. A narrow reef, on which are scattered mangroves, fringes the island.

Kwangtung Strait, the channel between Henry Lawrence Island and John Lawrence Island, has considerable depths in the fairway throughout. The drying reefs, that fringe both shores, are usually visible.

Rocky heads lie about 1/2 mile northward of Briton Point, the north end of John Lawrence Island. Shoals and foul ground extend about 1 1/2 miles northwestward from the northwest coast of the island.

Wilson Island lies westward of the north part of John Lawrence Island. The channel between the two islands is narrow. Round Hill, located about 1 mile within the northwest point of Wilson Island, is 710 feet high. The south and east coasts are thickly fringed with mangroves. Foul ground, on which are many coral heads, extends from the northwest point of Wilson Island to Briton Point on John Lawrence Island.

Nicholson Island, separated from Wilson Island to the northeastward by a strait, nearly 1 mile wide, is hilly. Its north summit is 390 feet high. Prominent, steep-to, white reefs fringe the west side of the island to a distance of up to 400 yards. Shoal ground, as defined by the 5-fathom curve, extend a little more than 1/3 mile north-northwestward from the north point of the island. A reef extends about 600 yards southward from the south point of the island. A shoal, with a depth of 1 3/4 fathoms over it, lies close southward of the extremity of the reef.

Sir William Peel Island, low and densely bordered by mangroves, lies about 1/2 mile eastward of Nicholson Island. A channel, suitable only for small craft with local knowledge, separates the two islands. The channel between Sir William Peel Island and Wilson Island to northward is narrow and foul.

8B-36 TADMA JURU, which is narrow and deep, separates Sir William Peel Island from Havelock Island to the southward.

Rosamund Shoal, a narrow ledge of coral heads, is nearly awash and steep-to on its east side. Its south end lies about 1/2 mile northward of Stowe Point, the north end of Havelock Island. The ledge is usually difficult to identify. Vessels should not attempt to pass through the narrow channel between this ledge and Sir William Peel Island when entering Tadmā Juru.

DIRECTIONS.—Vessels approaching Tadmā Juru from westward should pass southward of Rosamund Shoal. A recommended course is to steer 090° to pass about 400 yards northward of Stowe Point. When about 300

yards from the southwest coast of Sir William Peel Island, the course should be altered to 123°, keeping in midchannel. When close to the east entrance of the strait, the course should be altered to 073° toward the reef skirting the southwest coast of John Lawrence Island. This reef is steep-to and is usually visible. When close to the edge of this reef, the course should be altered to 147°, which leads along the west edge of the reef and thence eastward of Pilot Reef (sec. 8B-37) which is located about 1 mile southward of the south end of John Lawrence Island.

Directions for entering Tadmā Juru from southward or eastward are given in section 8B-37.

WEST SIDE OF RITCHIES ARCHIPELAGO (CONTINUED).—Between Stowe Point and Doone Point, about 3 3/4 miles southwestward, the west coast of Havelock Island is slightly indented by an open reef-fringed bight. ANCHORAGE can be taken off Jalebar, which is located about 2 1/4 miles south-southwestward of Stowe Point.

Between Doone Point and the south end of Havelock Island, about 9 3/4 miles southeastward, the coast is fringed by a reef that extends up to 1/2 mile offshore. Two small bights are located 2 and 5 miles, respectively, southeastward of Doone Point. White cliffs, about 90 feet high, form the south end of the island. Sail Rock, 20 feet high and standing about 200 yards off the south end of the island, appears as a sail on some bearings.

Fusilier Channel (Nancowry Strait) and the islands farther southward are described in section 8B-38.

EAST SIDE OF RITCHIES ARCHIPELAGO

8B-37 ISLANDS AND DANGERS.—The north side of Outram Island and Charka Juru, the channel separating it from Henry Lawrence Island, have been described in section 8B-35. The east side of Outram Island is fringed by a reef that extends up to 600 yards offshore. As previously stated, coral heads and foul ground extend about 3/4 mile southward from the south end of Outram Island.

The east coast of Henry Lawrence Island is low, irregular, and thickly bordered with mangroves. Reefs fringe the coast to a distance of 1 mile offshore. A densely wooded is-

let lies on this reef in a position about 4 miles southward of the south end of Outram Island; the reef dries out for a short distance of the islet.

Inglis Island is located about $3/4$ mile eastward of the wooded islet. The channel between the islet and the island has a least depth of 6 fathoms. A reef, that dries and is steep-to, fringes all except the northwest coast of the island. This reef extends up to $1/2$ mile off the northeast coast, where it terminates in 2 rocks about 4 feet high. Small portions of the north and south points of the island have been detached by the action of the sea. They are joined to the island by a drying reef, but appear as islets at high tide.

Inglis Shoals, two coral patches with depths of $3\ 3/4$ and $4\ 3/4$ fathoms, are located about $3/4$ mile southward and $1\ 3/4$ miles south-southeastward, respectively, of the south point of Inglis Island.

ANCHORAGE, affording shelter from northeasterly winds, can be taken in 7 fathoms, off a sandy bay, just northwest of Wreck Point, the south extremity of Henry Lawrence Island.

TADMA BAY lies westward of Runnymede Point, the south point of John Lawrence Island, and between it and Sir William Peel Island. It forms the south entrance of Paranga Juru, a narrow channel separating John Lawrence Island from Sir William Peel Island. It also forms the east entrance of Tadma Juru which has been described in section 8B-36.

Pilot Reef, located about 1 mile southward of Runnymede Point, has a least depth of $2\ 1/2$ fathoms. A narrow coral ledge, as defined by the 5-fathom curve, extends about 1 mile southward from Pilot Reef.

Havelock Island, southward of Sir William Peel Island, is fringed by a coral reef. Foul ground extends up to $1\ 1/4$ miles eastward from its northeast coast to within a short distance of the ridge that extends southward from Pilot Reef.

ANCHORAGE, sheltered from all but southerly winds, can be taken in Tadma Bay.

DIRECTIONS.—Vessels approaching Tadma Bay from the southward and eastward can clear Pilot Reef and the foul ground eastward of Havelock Island by bringing the west extremity of Sir Hugh Rose Island (sec. 8B-38)

bearing 173° and just open eastward of the east extremity of Neill Island (sec. 8B-38). When the extremity of the reef extending southward from Runnymede Point is seen, the course can be shaped northwestward into Tadma Bay.

OFF-LYING DANGERS.—Minerva Ledge, an isolated rocky ledge with a least depth of $3\ 3/4$ fathoms, is located about $4\ 1/2$ miles east-southeastward of Wreck Point. It lies near the outer edge of a bank, as defined by the 20-fathom curve, that extends about 5 miles eastward from the south end of Henry Lawrence Island.

Vibart Shoal, narrow and steep-to on its east side, extends $1\ 2/3$ miles south-southwestward from a position about $6\ 1/2$ miles southeast by eastward of Runnymede Point.

8B-38 FUSILIER CHANNEL (Nancowry Strait), between Havelock Island and Neill Island to the southward, has considerable depths in the fairway. A small coral patch, with a least depth of 7 fathoms, lies in the west part of the channel, about $3/4$ mile northward of the northwest point of Neill Island. Vessels should pass northward of this patch.

NEILL ISLAND is 465 feet high at its northeast point which is formed by prominent white cliffs which rise steeply from the sea. A rock about 20 feet high, lies about 100 yards off this point. Reefs fringe the north coast. Some detached patches, with depths of $4\ 3/4$ to 5 fathoms, and other foul ground, lie up to $1/2$ mile off this coast. The south coast of the island is low and partly bordered with mangroves. A reef extends up to $1/2$ mile off the south end of the island. The seas break heavily on this reef. The south point of the west coast of Neill Island is formed by dark-colored cliffs, about 40 feet high, and steep-to.

Sir Hugh Rose Island, the southernmost island of the Ritchies Archipelago, lies about 2 miles southeastward of Neill Island and is densely wooded. The highest part, which has a height of 240 feet, is on the northwest side of the island. Some prominent yellow cliffs, about 80 feet high, stand on the northeast extremity of the island.

A reef, about 200 yards wide, fringes the island. Rocky ground, on which the seas break, extends about 200 yards farther eastward. A

rocky bank, as defined by the 5 1/2 fathom curve, extends a little over 1/2 mile westward, and about 1/3 mile southwestward from the island.

A shoal, with a least depth of 3 fathoms at its north end, extends 1 mile southeastward from a position about 1 1/2 miles south-southwestward from the southwest extremity of Neill Island.

CHANNEL.—Several patches, with depths of 4 1/4 to 5 1/4 fathoms, are found in the channel between Neill Island and Sir Hugh Rose Island. Vessels are CAUTIONED against using this channel as the bottom is very uneven.

Deep draft vessels, passing westward of Sir Hugh Rose Island, should avoid a 9-fathom bank, located from 1 1/2 to 2 1/2 miles southwestward of that island.

ANDAMAN STRAIT

8B-39 GENERAL REMARKS.—The east entrance of Andaman Strait lies between North Point (sec. 8B-31), a 250-foot promontory forming the southeast extremity of Baratang Island, and South (Dorrington) Point, the northeast extremity of South Andaman Island, about 2 miles south-southwestward. From the 250-foot promontory the coast trends west-southwestward from 1 3/4 miles to Entrance Hill, the north point of the inner entrance of the strait. The hill is 100 feet high, conical and conspicuous.

Andaman Strait, at its east end, separates Baratang Island from South Andaman Island; at its west end it separates Middle Andaman Island from South Andaman Island. (See section 8B-12). The general width of the strait is from 400 to 600 yards, but in places its width is reduced to 80 yards.

DEPTHS.—The strait has moderate depths, except for two ridges, which cross the strait and over which the least depth is 3 fathoms. A bar, over which there are depths of 11 to 13 feet, obstructs the entrance of the strait between a position about 1/2 mile northeastward of Entrance Hill and South Point. The navigable width of the bar channel is about 200 yards. A vessel, with a draft of 13 feet has passed through the strait. The bottom throughout the strait is of mud and sand.

DANGERS.—A small isolated, rocky ledge with a prominent rock, 13 feet high, lies

about 1/2 mile southeastward of the 250-foot promontory. A detached shoal, with a least depth of 7 feet, lies almost 1/2 mile southward of the same point.

A coral reef, which dries in patches, extends up to 1/2 mile offshore between North Point and Entrance Hill.

A ledge of drying coral reefs extends nearly 1/2 mile northeastward from South Point. The coast, between this point and the south point of the inner entrance of the strait, about 1 1/2 miles westward, is fringed by a bank of dead coral, mud and stones, which extends nearly 1/4 mile offshore.

ISLAND.—Oral Kaicha (12°11'N., 92°46'E.), an island located about halfway between the east and west entrances of Andaman Strait, may be passed on either side, although the channel eastward and northward of it has the more moderate curves.

ANCHORAGE can be taken in 9 to 10 fathoms, about 1 1/4 north-northeastward of South Point.

PORT MEADOWS AND APPROACHES

8B-40 COAST.—Between South Point and Cape Diamond (Wedge Point), about 1 1/2 miles southward, the coast is fringed by a drying reef that extends nearly 1/4 mile offshore.

OFF-LYING DANGERS.—Smyth Rock, the outermost danger off this coast, is a pinnacle with a depth of 1 3/4 fathoms, rising abruptly from depths of 8 fathoms. It lies 1 mile eastward of South Point.

Whitehouse Rock, located about 1 mile eastward of Cape Diamond, has a least depth of 2 fathoms. A shoal, with a least depth of 4 feet, lies midway between the rock and the point.

DANGERS.—A rock, 1 foot high, is located about 1/2 mile southeastward of South Point. Rocks, that dry 3 and 4 feet, are located about 900 yards northward and 600 yards north-northeastward, respectively, of Cape Diamond.

Wedge Rock, 28 feet high and prominent, lies about 100 yards southward of the same point.

CAUTION.—A 1957 survey has shown discrepancies in the chart. Mariners are urged to use caution when navigating in this area.

PORT MEADOWS is entered between Cape Diamond and Cape Persain, a little over 1

mile southwestward. The shores of the port are fringed by reefs, and the surrounding land is mostly low with extensive tracts of mangroves, intersected by creeks and forming several islets. Cape Persain is the northeast extremity of a densely wooded hill, 200 feet high, located on a promontory which is separated from the main island by mangroves.

ISLAND.—**DUNCAN ISLAND**, 297 feet high and densely wooded, is connected to the shore westward of Cape Diamond by a drying shoal with a least depth of 3 feet.

DEPTHS.—The entrance channel, between the south side of Duncan Island and Cape Persain, about 650 yards southwestward, has a least depth of 11 fathoms.

DANGERS.—A drying reef extends about 250 yards northward from Duncan Island. The east and south sides of the island are fringed to a distance of about 200 yards with above-water and sunken rocks. One of the above-water rocks, 18 feet high and prominent, lies close off the southwest side of Duncan Island. A rock, that dries 1 foot, is located 150 yards southwestward of the 18-foot rock.

The east side of the promontory forming Cape Persain is fronted by a drying reef to a distance of 800 yards. This reef only projects about 200 yards offshore, eastward and northward of Cape Persain. There are some rocks that dry from 2 to 6 feet on the reef.

A detached 15-foot patch lies outside the 6-fathom curve in a position about 350 yards eastward of Cape Persain.

A rock, on which there are two pinnacles, with a least depth of 2 3/4 fathoms over them, lies on the south side of the approach to Port Meadows in a position about 2/3 mile southeastward of the summit of Duncan Island.

The Patch, a shoal with a least depth of 4 fathoms, lies about 3/4 mile east-southeastward of Cape Persain.

ANCHORAGE can be taken in 9 to 10 fathoms, about 450 yards westward of the west point of Duncan Island. Anchorage can be taken in 8 fathoms in the center of the southwest part of the harbor, about 3/5 mile westward of Cape Persain.

DIRECTIONS.—Vessels should keep Cape Persain bearing 276° until the east end of Duncan Island is in range with Cape Diamond bearing 012°, whence a course of about 292° leads in midchannel through the entrance. When Wedge Rock becomes visible, the course

can be altered to 000° for the eastern anchorage, or to 260° for the western anchorage, described above.

FOREST CAMP.—A jetty projects from the west side of the promontory, in a position about 700 yards westward of Cape Persain. A forest camp is located near the root of the jetty.

COASTAL FEATURES—CAPE PERSAIN TO NORTH POINT

8B-41 Between Cape Persain (12°01'N., 92°47'E.) and Point Crawley, about 3/4 mile southward, and thence to Kotara Point, about 1 1/2 miles farther southwestward, the coast is fringed by a drying reef to a distance of up to 1/2 mile. The 10-fathom curve lies up to 1 mile from the edge of this reef. Some above-water rocks lie on the drying reef. A rock, that dries 6 feet, lies a little over 1/2 mile east-southeastward of Point Crawley.

KOTARA ANCHORAGE.—The entrance of Kotara Anchorage lies between Kotara Point and the north side of Kyd Island, about 3/4 mile southward. The island is 780 feet high and rounded. A fringing reef, that dries, extends about 200 yards northward and 400 yards eastward from this island.

DEPTHS of 4 1/2 to 8 fathoms are found in the entrance. A least depth of 3 1/2 fathoms is found in the fairway.

CAUTION.—A 1957 survey discovered uncharted shoals in Kotara Anchorage. Mariners are urged to use caution when navigating in this area.

ANCHORAGE can be taken in 3 1/2 to 4 fathoms, mud, about 1/2 mile southwestward of Kotara Point. Small vessels with local knowledge can anchor within an inlet that branches northward from a position about 1 mile westward of the same point. Depths of 4 to 4 1/2 fathoms, mud, are found in the outer part of the inlet.

SHOAL BAY.—Shoal Bay, entered between the southeast side of Kyd Island and Cape Masy, about 1 1/2 miles southeastward, is an inlet fringed by mangroves. The inlet extends westward for about 2 1/2 miles and leads to Shoal Bay Creek, a long, narrow inlet that extends southward between wooded hills.

Depths of 3 1/2 fathoms are found in the entrance channel fairway. The depths decrease to 3 fathoms about 1 1/2 miles within

the entrance, and to 1 fathom at the entrance of Shoal Bay Creek.

COAST.—Between Cape Masy and North Point, about 14 miles southward, the coast is bold and free from dangers outside a distance of 1/2 mile offshore. The land rises to form a broken ridge which parallels the coastline at a distance of about 2 miles. Koyob, located about 6 3/4 miles northward of North Point, attains a height of 1,505 feet.

PORT BLAIR

8B-42 PORT BLAIR is entered between North Point and South Point, a little over 2 miles southward. The port consists of an inlet 4 miles long, entered by two passes and indented by several bays. The port is divided into an exposed outer harbor and a protected inner harbor. Port Blair is the headquarters of the Chief Commissioner, who is the representative of the Indian Government for the Andaman and Nicobar Islands. The residence of the Chief Commissioner and the principal administrative offices are located at Aberdeen, a village on the south side of the harbor, located about 1 mile west-northwestward of South Point. The port administration is under a Naval Officer, who resides at Aberdeen and has the combined duties of harbor master, shipping officer, and port engineer. Port Blair, although important politically, is of little commercial importance. A naval base is located at the port.

DEPTHS

8B-43 Considerable depths are found in the north entrance channel, between North Point and Ross Island. The least depth in the fairway of South Channel, between Ross Island and South Point, is 25 feet. A 17-foot shoal lies in this channel in a position about 800 yards east-southeastward of Atalanta Point.

Depths of over 10 fathoms are found in the outer harbor. Depths of 3 to 15 fathoms are found in the inner harbor.

Depths in the anchorages range from 7 to 9 fathoms. Depths at the main berths range from 7 to 19 feet.

CAUTIONS

8B-44 A number of sunken lighters and barges are located in the harbor area, but

none are considered dangerous to navigation. Earthquakes occur in this area. Extensive damage was caused by an earthquake in 1940.

CURRENTS

8B-45 The currents in Port Blair are weak and are affected by the prevailing winds; they rarely exceed 1 knot. During the Northeast Monsoon the current sets southward; during the Southwest Monsoon the current sets between north and east. Heavy seas and swells occur in the outer harbor during the Northeast Monsoon. The inner harbor is well sheltered from sea and swell. The mean range of the tide is 4.6 feet, and the spring range is 6.7 feet.

WINDS AND WEATHER

8B-46 Port Blair has a mean temperature of 82°F. Storm signals are displayed at the light station on Ross Island. The Indian General System is used. (See sec. 1-34).

ENTRANCE CHANNELS—ISLAND AND DANGERS

8B-47 ROSS ISLAND divides the entrance of Port Blair into a north and a south entrance channel. The island, which is roughly triangular in shape, lies about 800 yards northeastward of South Point. The former residence of the Chief Commissioner stands at an elevation of 147 feet on the highest part of the island in a position about 1 1/2 miles south-southeastward of North Point. A dark stone building, with battlements, about 56 feet high, stands near the north end of Ross Island.

A reef fringes the island to a distance of up to 300 yards, except for a small portion of its west side. A shoal, as defined by the 3-fathom curve, extends about 1/3 mile northwestward from the northwest end of the island.

The 17-foot shoal, located about 800 yards east-southeastward of Atalanta Point, has been described in section 8B-43.

NORTH SHORE OF PORT BLAIR

8B-48 North Point is fringed by a drying reef and outside it shoal ground, as defined by the 5-fathom curve, extends nearly 1/4 mile southward.

North Bay, entered between North Point and

Perseverance Point, nearly 1 mile southwestward, indents the shore to a distance of 1 mile. The shores of the bay are fringed by a reef that extends up to 350 yards from its west side. A drying sand flat fronts the head of the bay to a distance of 400 yards. Mount Harriet, about 1 3/4 miles northwestward of North Point, rises steeply to a height of 1,193 feet. Some buildings stand close to its summit.

Semiramis Bay is entered between Lime Kilns Pier and Command Point, about 900 yards west-northwestward. The pier is located about 1/2 mile west-northwestward of Perseverance Point. A house, with a prominent white roof, stands about 200 yards northward of the pier.

Command Bay lies on the west side of Command Point, which is 140 feet high. Some buildings stand within the point. The settlement of Hope Town stands at the head of the bay.

Bamboo Flat Bay, with some buildings near its head, is entered between a point located 750 yards northwestward of Command Point and Shore Point, about 3/5 mile west-southwestward. Shoal ground, as defined by the 2-fathom curve, extends up to 250 yards westward from the west shore of the bay.

SOUTH SHORE OF PORT BLAIR

8B-49 SESOSTRIS BAY is entered between South Point (11°40'N., 92°45'E.) and Atalanta Point, about 3/4 mile northwestward, the bay is almost completely filled with reefs and a 12-foot patch lies on a line joining the entrance points in a position about 560 yards south-southeastward of Atalanta Point Beacon. South Point is fringed by a shore reef to a distance of about 200 yards.

A conspicuous temple is located about 1/2 mile westward of South Point. A memorial pillar and a school building, both of which are conspicuous, stand on the southwest shore of Sesostris Bay.

A large and prominent building, formerly a jail, is located close within Atalanta Point. The building has a conspicuous tower. A conspicuous mast, 195 feet high, stands about 200 yards southwestward of the building.

SESOSTRIS SHOAL consists of 2 coral patches, the outer of which lies in the approach to the south entrance channel, about

9/10 mile south-southeastward of South Point, and about 1/2 mile offshore. It has a least depth of 13 feet. The inner patch, lying about 250 yards west-southwestward of the outer patch, has a least depth of 12 feet. Atalanta Point Beacon, bearing 312° and in range with a conspicuous beacon located about 167 yards north-northwestward of Command Point, leads northeastward of Sesostris Shoal.

PHOENIX BAY is entered between Phoenix Point, located 5/6 mile westward of Atalanta Point, and a point about 800 yards west-northwestward. Blair Reef extends about 800 yards east-northeastward from the latter point. Some rocks, 1 foot to 2 feet high, stand on the reef. A 17-foot patch lies about 200 yards east-southeastward of the drying extremity of Blair Reef. A conspicuous building stands on the west shore of Phoenix Bay.

BLAIR POINT, about 800 yards west-northwestward of the west entrance point of Phoenix Bay, is fringed by a reef that extends about 250 yards offshore.

CHATHAM ISLAND, located about 1/4 mile northward of Blair Point, is connected to it by a conspicuous causeway. Some buildings and a prominent chimney, 95 feet high, stand on the island.

INNER PART OF PORT BLAIR

8B-50 Westward of Chatham Island, the harbor trends southward, and from Blair Point the coast trends southwestward for 3/5 mile to Hood Point, and thence southward for about 3/4 mile to Navy Point, forming the east side of the inner harbor. A conspicuous radio mast stands close eastward of a prominent house, about 2/3 mile eastward of Navy Point. NAVY BAY lies between Navy Point and Lewis Point, about 9/10 mile south-southwestward.

MANGROVE BAY is entered between Shore Point (sec. 8B-48) and the coast, about 3/5 mile west-southwestward. The bay is shoal. Its inner port dries and is covered with mangroves. Brigade Creek, a rambling waterway leading through the mangroves, is entered at the head of the bay through an unmarked channel passing close off the east shore.

RANGER FLAT, having depths of less than 3 fathoms, extends about 850 yards south-

southeastard and 900 yards eastward from Shore Point. A 12-foot rocky patch lies nearly 1/2 mile southward of Shore Point.

Between the west entrance point of Man-grove Bay and Dundas Point, a little over 1 mile south-southeastward, the coast is slightly indented. Mutlah Bay, shoal and foul, lies near the south end of this stretch.

The head of the bay, westward of a line joining Dundas Point with Lewis Point, about 1 1/5 miles southward, is much indented and shoal.

Viper Island, on which stand several buildings, is located about 2/3 mile southwestward of Dundas Point.

NAVIGATIONAL AIDS

8B-51 A light is shown, at an elevation of 163 feet, from a steel framework structure, 56 feet high, on the northeast corner of the before-mentioned dark stone building on Ross Island.

Range lights for the north entrance channel are located near Atalanta Point. The front light is shown, at an elevation of 70 feet, from a white tower, 7 feet high, located about 400 yards westward of Atalanta Point. The rear light is shown, at an elevation of 144 feet, from a white tower, 7 feet high, located about 300 yards southwestward of the front light. The white towers are surmounted by large white crosses which serve as good daymarks. These lights, in range 214°, lead through the north entrance channel. These lights are difficult to identify from seaward on account of near-by shore lights.

Atalanta Point Beacon, a white iron framework structure, 12 feet high and surmounted by a cross, stands on the edge of the reef which extends about 200 yards off the point.

A red obstruction light is shown from a conspicuous radio mast, located about 1 1/4 miles west-southwestward of Atalanta Point.

A light is shown from the head of Aberdeen Jetty.

A beacon stands on the east side of North Bay in a position about 2/3 mile north-northwestward of North Point.

A white conical buoy is moored about 350 yards eastward of the southeast end of Perseverance Point. A similar buoy is moored 350 yards westward of the same point.

A beacon is located on Shore Point.

A conspicuous beacon, which is the rear

mark for the south entrance channel range, stands on Command Point.

A white conical buoy is moored 830 yards eastward of Shore Point. A similar buoy is moored 800 yards east-southeastward of the same point. These buoys, due to rust formation, often appear to be red in color.

Two beacons, each consisting of a white wooden framework, with a cross topmark, are located about 400 yards south of the head of Phoenix Bay.

A white pillar lighted buoy, occasionally showing a fixed light, marks the northeast end of Blair Reef.

A white spherical buoy is moored about 65 yards northward of the northeast extremity of Chatham Island. A red spherical buoy is moored about 150 yards west-southwestward of the west end of that island.

ANCHORAGES

8B-52 Vessels can anchor in 6 or 7 fathoms, mud, about 1/2 mile west-southwestward of Chatham Island, with the northwest extremity of that island bearing 068°. This anchorage is well-sheltered.

Small vessels can anchor westward of Ross Island, in 8 or 9 fathoms, sand, in a position between 250 and 400 yards southwestward of the northwest end of Ross Island. This is a fair-weather anchorage.

A black mooring buoy is located about 150 yards off the north side of Chatham Island. A mooring buoy is located about 200 yards north-northwestward of the northeast end of the island.

PROHIBITED ANCHORAGES.—Vessels are prohibited from anchoring in an area which crosses the south entrance channel from a position close northwestward of South Point to a position on the middle of the west side of Ross Island, about 3/5 mile northeastward. A submarine cable crosses this area.

Anchorage is prohibited in the vicinity of a telegraph cable which crosses the inner harbor in a westerly direction from a position about 1/4 mile southward of Hood Point to a position about 1/2 mile west-southwestward.

DIRECTIONS

8B-53 Vessels entering Port Blair by way of the north channel should pass about 1/2 mile northward of Ross Island, and thence

about 1/4 mile southward of Perseverence Point, Shore Point, bearing less than 293° and open of the east end of Chatham Island, leads northward of Blair Reef. A midchannel course between Chatham Island and Command Point should then be steered. The northwest end of Chatham Island should be rounded at a distance of about 200 yards, whence a course of about 237° leads to the anchorage.

Vessels bound for the anchorage westward of Ross Island should keep the light-towers located close westward of Atalanta Point, in range 214°. When South Point bears 166°, the course should be altered to that bearing until the jetty on the northwest extremity of Ross Island bears 090°. Thence an easterly course should be steered for the anchorage.

Vessels from southward using the south entrance channel should keep Atalanta Point Beacon bearing 313°, and in range with the beacon on Command Point, which leads close southwestward of the 17-foot patch in the fairway, about 800 yards southeastward of Atalanta Point. When South Point bears 160°, the course can be altered northward to keep the point astern on that bearing. When the north extremity of Ross Island bears 090°, the course can be altered northwestward to pass midway between Blair Reef and Perseverence Point, and thence as directed above.

Vessels bound for the anchorage westward of Ross Island, should approach the south entrance channel as directed above. When South Point bears 185°, the course should be altered northward and the point kept on that bearing astern, which leads to the anchorage.

PORT BLAIR (11°41'N., 92°44'E.)

8B-54 FACILITIES.—The residences of the Chief Commissioner and all official residences and offices are located in Aberdeen, a short distance westward of Atalanta Point. The principal exports are timber, coconuts and copra.

BERTHS.—There are 1,140 linear feet with depths of 7 feet or more alongside. The largest vessel that has berthed alongside had a length of 350 feet and a draft of 19 feet.

A jetty, suitable only for small boats, extends a short distance northwestward from the northwest extremity of Ross Island.

A wooden pier extends westward from the coast, about 150 yards southward of the jetty.

A wharf, used by ferry launches, lies close southward of the wooden pier.

Two jetties extend from the northwest shore of Sesostris Bay. Aberdeen Jetty, the northern of the two, is built of stone and has some landing steps. It is accessible for boats at all stages of the tide.

Lime Kilns Pier extends a short distance in a west-southwesterly direction from aposition about 1/2 mile west-northwestward of Perseverence Point.

A pier extends southward from the head of Semiramis Bay.

A small jetty is located about 150 yards east-northeastward of the extremity of Shore Point.

Two lighter jetties are located 100 yards southward of Phoenix Point. The southern jetty has depths alongside of 6 feet.

Jetties extend from the north and southwest sides of Chatham Island. The head of the north jetty has a length of about 280 feet, with depths of 20 to 24 feet alongside.

Tug.—A government tug of 22 hp. is stationed at Port Blair.

CARGO INFORMATION.—Ships use their own stevedore gear. A 5-ton steam crane is located on the jetty at Phoenix Point. Some smaller cranes are located on the jetties about the harbor. Some lighters and landing craft are available. Covered and open storage space is available.

PROVISIONS of all kinds are imported and are therefore scarce at all seasons. Limited supplies of butter and fish can be obtained from government sources.

WATER can be supplied to vessels at anchorage by a water boat at a rate of 20-tons per hour. Water for drinking purposes should be chlorinated.

REPAIRS of a minor nature can be made.

COMMUNICATIONS.—Regular sea communication is maintained with Madras, Rangoon and Calcutta. Port Blair is in regular radio communication with Kondol Harbor in the Nicobar Islands.

MEDICAL.—There is a government hospital at Aberdeen.

COASTAL FEATURES—SOUTH POINT TO CHIRIYA TAPU

8B-55 Between South Point (11°40'N., 92°46'E.) and Chiriya Tapu, about 11 1/2 miles south-southwestward, the east coast of South

Andaman Island, is bold with the 100-fathom curve lying up to 2 1/2 miles offshore. The fringing reef extends up to 600 yards offshore. Sesostris Shoal (sec. 8B-49) is the only coastal danger.

Chiriyá Tapu, the south end of South Andaman Island and the northeast entrance point of Macpherson Strait, is a prominent bare promontory with some caves at its base. A rock, 1-foot high, lies about 1/2 mile westward of the point.

Macpherson Strait and the anchorage north-westward of Chiriyá Tapu have been described in section 8B-20.

EAST COAST OF RUTLAND ISLAND

8B-56 The general aspect and the west coast of Rutland Island have been described in section 8B-21.

Portman Bay, which is open to heavy swells during the Northeast Monsoon, indents the east coast of the island. The head of the bay is shallow and terminates in a mangrove swamp.

Rocks, both above-water and sunken, extend some distance off the south-coast of Rutland Island. This coast should be given a berth of 1 1/2 miles.

Investigator Rock (11°20'N., 92°37'E.), located off the west end of the south coast of Rutland Island, has been described in section 8B-21.

ISLANDS, DANGERS AND PASSAGES BETWEEN RUTLAND AND LITTLE ANDAMAN ISLANDS

8B-57 MANNERS STRAIT lies between the southeast coast of Rutland Island and Cinque Islands, about 3 miles southeastward. Investigator Rock, a danger on the northwest side of the strait, is described in section 8B-56. A shoal, with a least depth of 9 fathoms, lies about 2 1/3 miles eastward of the rock. Depths of over 10 fathoms are found in the fairway. Tide rips occur in the strait.

A large shoal area, with depths of 6 to 10 fathoms, is centered with its shoalest part about 6 1/2 miles southwestward of the southwest side of Rutland Island.

CINQUE ISLANDS are two hilly islands which are almost joined by a rocky ledge that dries 7 feet. The trees on both islands have grown in distorted shapes as a result of the

monsoons. Two summits, 529 and 569 feet high, form a saddle near the north end of the north island. A small, conical, bare hill, 293 feet high, stands near the south end of the island. A promontory projects west-northwestward from this hill. South Cinque Island, 545 feet high, has a 410-foot conical knoll near its south end.

ANCHORAGE in 7 to 10 fathoms, dead coral and sand, can be taken westward of the sunken ledge that nearly joins the two islands, with the west point of North Cinque Island bearing 349°. Small vessels can anchor off the west side of South Cinque Island, in 13 fathoms, with the conical knoll at its south end bearing about 168°, distant 1 mile.

PASSAGE ISLAND, 351 feet high at its north end, is located about 3 1/4 miles south-southwestward of South Cinque Island. The south end of the island is low. A detached rock, 6 feet high, lies about 600 yards northward of the north end of Passage Island. A shoal, with a least depth of 6 fathoms, lies 2 miles west-southwestward of the same point. This shoal is a narrow, rocky ridge, fringed with sand, over which there are overfalls during spring tides. Small patches, with depths of 8 to 10 fathoms, lie southward and northeastward of this shoal.

The CHANNEL, between South Cinque Island and Passage Island, is deep. Tide rips occur at spring tides.

THE SISTERS, two small islets, lie close together in a position about 3 1/2 miles southeastward of Passage Island. The islets rise from coral banks on which there are depths of 10 fathoms and less. A ledge connects the islets, and a rocky spit, part of which dries, extends about 3/4 mile northwestward from this ledge. East Sister Island is 306 feet high, and West Sister Island is 232 feet high.

DUNCAN PASSAGE lies between The Sisters and North Brother Island, located about 10 miles south-southwestward. It is the main channel between Little Andaman Island and Rutland Island. Depths of 12 to 20 fathoms are found in the fairway.

Shoal ground, with depths of 2 3/4 to 10 fathoms, lies between a position 2 miles west-northwestward and 3 miles northeastward of the north end of North Brother Island. A 6 3/4-fathom patch lies about 1 1/2 miles eastward of the island.

TIDAL CURRENTS in Duncan Passage

have been described in section 8-4. THE BROTHERS, two small, flat-topped islands, lie about 10 miles and 14 1/2 miles, respectively, south-southwestward of The Sisters. Each island is about 90 feet high to the tops of the trees and has a lagoon in its middle part. North Brother Island is fringed by a reef which extends 1 3/4 miles west-northwestward from it.

Foul and unexamined ground lies between North Brother Island and South Brother Island. Leeboard Ledge, a detached shoal, the position of which is approximate, lies between the two islands. Foul ground extends 5 miles west-northwestward and 1 1/2 to 2 miles north-northwestward from South Brother Island. In the latter direction, the foul ground terminates in a reef awash and usually breaking. A reef lies southeastward of the island.

LITTLE ANDAMAN ISLAND

8B-58 Little Andaman Island, the southernmost of the Andaman Islands, lies nearly 28 miles southward of Rutland Island. The island, although appearing from a distance to be nearly level, rises gradually to a 600-foot summit near its center. It is well wooded.

The passage between Little Andaman Island and South Brother Island has not been examined closely. Ariel Ledge and other dangers lie in this passage.

Bumila Creek indents the north side of Little Andaman Island which is low. The creek cannot be identified until close off the entrance, which then appears as a gap in the trees. A reef, on which the seas usually break, extends nearly across the entrance of the creek.

ANCHORAGE, suitable for small vessels with local knowledge, can be taken in 8 fathoms, dead coral, about 800 yards northward of the entrance of the creek, with the center of the entrance bearing 158°. The anchorage should be approached from the northwestward only, as the depths northeastward are shallow and irregular. The tidal currents set eastward and southeastward at the anchorage. There is sometimes a strong ebb current flowing out of Bumila Creek.

Jackson Creek, which indents the northwest coast of Little Andaman Island at a

position about 9 miles southwest of Bumila Creek, can be identified by a conspicuous square clump of trees that falls abruptly to the water's edge. A reef appears to extend 3/4 mile northward from the west point of the bay into which Jackson Creek debauches. It was reported that ANCHORAGE is available in 7 1/2 fathoms about 1 mile north-northwestward of the entrance of the creek. Some prominent cliffy, sandstone islands, hollowed with caves, are located in the northeast part of the bay.

The coast, between Jackson Creek and Sandy Point, the southwest end of Little Andaman Island, 16 miles southward, appears to be fringed by a reef with a sandy beach. The coast just southward of the creek is cliffy.

Api Islet lies close offshore in a position about 9 miles southward of Jackson Creek. The islet serves as a good landmark.

A reef, that dries 4 feet, extends nearly 3/4 mile offshore from the southeast extremity of Little Andaman Island.

The northeast coast of Little Andaman Island has not been closely examined. Hut Bay indents the southeast coast of the island, southeastward of its summit.

TEN DEGREES CHANNEL, between Little Andaman Island and Car Nicobar, about 77 miles southward, is deep.

SOUTH SENTINEL ISLAND and DALRYMPLE BANK, which lie northwestward and southwestward, respectively, of Little Andaman Island, are described in sections 8B-4 and 8B-3.

NARCANDOM ISLAND, BARREN ISLAND AND INVISIBLE BANK, which lie eastward of the Andaman Islands, are described in sections 8B-4 and 8B-3.

PART C. NICOBAR ISLANDS

8C-1 CAR NICOBAR (9°15'N., 92°46'E.), the northernmost island of the Nicobar Islands, is located about 90 miles south-southeastward of Little Andaman Island and is densely wooded, mostly coconut palms. The highest ridge, which has an elevation of about 200 feet, is located in the southwest part of the island. Coconuts are the main export.

SAWI BAY indents the northwest coast between Keating Point and Hog Point, about 3 1/2 miles southwestward. Foul ground extends

about 1 mile northward from the former point and nearly 1/2 mile northward from the latter point. The village of Sawi is located about 1/2 mile southeastward of Hog Point. An observation spot is located on a small promontory that projects west-northwestward from a position a little over 1 mile southward of Keating Point.

A coral patch, with a least depth of 5 1/2 fathoms, was reported about 2/3 mile northwestward of the observation spot, and a 5-fathom patch lies 5/6 mile west-northwestward of the same spot.

The tidal currents set northeastward on the rising tide, off Sawi Bay.

ANCHORAGES.—Vessels can anchor in 12 fathoms, over a bottom of rock and coral, covered by a thin layer of sand, about 3/4 mile northward of Sawi. Anchorage can be taken in 12 fathoms, just over 1 mile westward of the observation spot. Small vessels, having local knowledge, can anchor closer inshore, off the observation spot.

ARONG, a village, is located about 3 miles southward of Hog Point. **ANCHORAGE** can be taken in 9 to 11 fathoms, about 1/2 mile off the village. Vessels should approach the anchorage with the village bearing 090°.

KEMIOS BAY is a slight indentation in the south side of the island. Kemios, a village which is fronted by a beach, lies close westward of a well-defined entrance of a creek. A village is located close eastward of this entrance. A reef, extending in an east-west direction, is reported to lie about 300 yards offshore.

The tidal currents set east-southeastward on the rising tide at a rate of 3 knots at springs, and in opposite directions on the falling tide.

Small vessels, with local knowledge, **ANCHOR** in 10 to 12 fathoms about midway between the two villages.

KAKANA, a small village, is located about 2 miles southwestward of the southeast end of Car Nicobar.

MUS, the principal village on Car Nicobar and the residence of the Assistant Commissioner, is located 3/4 mile southeastward of Keating Point. The village is located at the head of a small inlet, with a flagstaff near the southeast entrance point. The village of Lapate is located 1 mile southeastward of Mus.

ANCHORAGES.—Vessels can anchor off Mus in 7 1/2 fathoms, about 2/5 mile offshore, with the northeast extremity of Car Nicobar bearing 284°. The tidal currents at the anchorage are reported to attain a rate of 4 knots at springs. Vessels are liable to drag anchor.

Vessels can anchor in 12 fathoms, about 1/2 mile offshore, northeastward of Lapate.

TAMALU and **PERKA** are villages located 4 3/4 and 5 miles, respectively, south-southeastward of Keating Point. A **BEACON**, surmounted by a white triangle, stands about 200 yards southward of Tamalu. A beacon, surmounted by a white cross, stands in the village of Perka. It was reported (1958) that these beacons were missing.

ANCHORAGE can be taken, in 14 fathoms, about 1/2 mile offshore of either village.

MALACCA, a village, is located at the south end of a slight bight, about 6 miles southeastward of Keating Point. A small concrete jetty, which dries completely at low water, serves as a good landmark. Two groups of beehive-shaped huts, located close northward and southward, respectively, of the jetty, stand out clearly against the jungle-covered fore-shore. It was reported (1958) that a conspicuous two-storied house, painted white and green, with a red roof, was located about 600 yards south-southeastward of the jetty. A tall flagstaff was reported as standing about 200 yards northward of the jetty. It was reported (1958) that a white flagstaff, 25 feet high, was located close to the root of the jetty. There are two flagstaffs in the village. There is a hospital in the town.

A dangerous reef extends in a seaward direction from a position about 50 yards northward of the jetty.

BEACONS.—A small beacon, painted black and white, was reported as standing 80 yards east-southeastward of the head of the jetty. This beacon marked the edge of the southern reef.

A beacon, with a white cross topmark, is located about 475 yards south-southeastward of the root of the jetty. Another beacon, with a white cross topmark, stands near the root of the jetty. A white beacon, surmounted by a white triangle over a white cross topmark, stood about 700 yards south-southeastward of the root of the jetty.

ANCHORAGES.—Vessels can anchor off Malacca in 15 to 20 fathoms, with fair protection from the Southwest Monsoon. Vessels can make the approach with the flagstaff bearing 254° or with the jetty bearing 270°. Anchorage can be taken in the required depth, taking care to avoid a submerged wreck which lies about 1/2 mile east-northeastward of the jetty. In clear weather the breakers on the reefs, northward and southward of the anchorage, can easily be identified.

GENERAL REMARKS

8C-2 The Nicobar Islands extend about 160 miles south-southeastward from Car Nicobar, the northernmost island. These islands are a dependency of the Andaman Islands and are administered by the Assistant Commissioner who resides at Mus, Car Nicobar. The islands range from hilly and undulating to mountainous and volcanic. There are few rivers.

The Nicobar Islands are usually divided into three groups. The northern group consists of Car Nicobar and Batti Malv Island. The southern group consists of Great Nicobar and Little Nicobar with their off-lying islets. The central group includes all the remaining islands of the Nicobar Islands. Nancowry Harbor, between the islands of Camotra, Nancowry and Trinkat, is perhaps the most important and best sheltered harbor.

CHANNELS—DEPTHS

8C-3 The channels, between the groups of islands and between the individual islands, have irregular depths, but are for the most part deep and clear of dangers.

TIDAL CURRENTS AND CURRENTS

8C-4 See section 8-4.

WINDS AND WEATHER

8C-5 See section 8-3.

NORTHERN GROUP OF NICOBAR ISLANDS

8C-6 CAR NICOBAR, the northernmost island of the Nicobar Islands, is described in section 8C-1.

BATTI MALV ISLAND, about 17 miles south-southeastward of Car Nicobar, appears wedge-shaped from the offing. The island is very small and is about 150 feet high, the highest part being densely wooded. The northwest end of the island is low, but rocky cliffs rise vertically from the sea on the other coasts. Reefs appear to extend 1/2 mile off the northwest, southwest and southeast sides of the island. The 20-fathom curve, surrounding the island, lies up to 5 miles south-eastward and 2 3/4 miles northward of the island.



BATTI MALV ISLAND FROM WESTWARD

Bearing 079°, distant 20 M.

CENTRAL GROUP OF NICOBAR ISLANDS

8C-7 **CHOWRA ISLAND**, located about 24 miles south-southeastward of Batti Malv Island, is for the most part low, but at its south end a rocky pinnacle rises almost perpendicularly to a height of 343 feet. The island appears as a hat from the offing. Sanenya, located on the northeast coast of the island, is the principal village.

Reefs extend about 1 1/2 miles from the northwest side of the island. A shoal, with a least depth of 8 feet, lies between 2 1/2 miles northwestward and 4 miles north-northwestward of the north point of Chowra Island. Depths of 9 to 10 fathoms are found between the shoal and the island reef.

TIDAL CURRENTS in this area are described in section 8-4.

ANCHORAGE can be taken in 9 to 10 fathoms, abreast Sanenya village.

North end of Teresa I.
Bearing 086°

Southwest tangent
of Teresa I.
Bearing 106°

CHOWRA ISLAND

From West-Southwestward
Bearing 071°, distant 23 M.

TERESSA ISLAND

TILLANCHONG ISLAND lies with Cape Winifred, its south end, about 34 miles eastward of Chowra Island. Maharani Peak, the highest of several peaks forming a jagged ridge along the length of the island, is located about midway between the north and south ends of the island. The peak attains a height of 1,058 feet.

Paira Rock, 352 feet high, lies about 1/2 mile north-northwestward of Cape Maud, the north extremity of the island. Several detached rocks lie up to 1 mile off the west side of the island.

Isle of Man, a rock 404 feet high, is located about 2 3/4 miles southeastward of Cape Winifred. A chain of needle-like rocks extends in a curve between the rock and the cape.

A shoal, unexamined and having a depth of 11 fathoms, lies about 9 1/2 miles southwestward of the cape.

CASTLE BAY indents the southeast coast of the island between Castle Bay Point, located about 3 miles north-northeastward of Cape Winifred, and a position about 1 mile southwestward.

A rock lies awash in a position about 600 yards southward of Castle Bay Point. Foul ground, with depths of less than 5 fathoms, extends about 350 yards southward from the rock. There is deep water between the rock and the point.

ANCHORAGES.—There is fair-weather anchorage in Castle Bay, in 14 to 15 fathoms, with Castle Bay Point bearing 062°, distant a little over 1/2 mile.

Anchorage can be taken off Novara Bay, an open bight on the west side of the island, about 3 miles southward of Cape Maud.

8C-8 TERESSA ISLAND, located about 6 1/2 miles southeastward of Chowra Island, is roughly crescent-shaped. It appears as two separate islands, as its central part is lower than the north and south parts. The north end of the island is 897 feet high. Hinam, a village located about 4 1/2 miles south-southeastward of the northern 897-foot summit, is visible from seaward on a northeast bearing only. Laksi, a village standing amongst some trees and consisting of a few huts, is located about 4 miles southeastward of Hinam. The village is hard to identify from seaward. Bengala, located 2 miles southward of the northeast extremity of the island, stands

on the east side of the island. Kerawa village is located 3 1/2 miles farther southward.

Reefs extend over 1 mile from the north and south ends of the island and to a short distance from most of the west coast.

ANCHORAGES.—Small vessels with local knowledge can anchor close off Hinam in 6 to 14 fathoms. Such vessels can also anchor in 14 fathoms, coral and coarse sand, south-southwestward of Laksi, about 1/2 mile outside the coastal reef.

Small vessels with local knowledge sometimes anchor, in 25 fathoms, about 1/2 mile off Bengala with the northeast end of the island bearing 006°, the east end bearing about 146°, and the north end of Bompoka Island bearing 115°. This is a fair weather anchorage.

BOMPOKA ISLAND is located about 1 3/4 miles northeastward of the southeast tip of Teresa Island. A channel, with a least depth of 17 fathoms, separates the two islands. The island is 634 feet high. The village of Poahat is located on the west side of the island. Small vessels with local knowledge, can ANCHOR about 1/4 mile offshore with the village in range with the north peak of the island, bearing 040°. The depths decrease sharply and caution is required.

CAMORTA (KAMORTA) ISLAND

8C-9 CAMORTA ISLAND, separated from Tillanchong Island (sec. 8C-7) to the north-northeastward by a channel, about 12 miles wide, is very irregular in shape. The island is picturesque owing to the alternations of forests and grassy slopes, with white coral beaches backed by coconut palms. A 170-foot hill stands close inland of the northeast end of the island. A 435-foot hill stands at the southeast end of a range of hills that extends 4 miles southeastward from a position about 1 mile southeastward of the northwest extremity of the island. A hill, 720 feet high, stands about 1 mile northward of the south point of the island. Mount Edgumbe, a tree-covered hill 384 feet high, stands about 4 1/4 miles northward of the same point. There are villages and huts along the shores of the island.

The west coast is indented by bays forming Dring Harbor and Expedition Harbor (sec. 8C-12). Nancowry Island lies close southward

of, and overlaps, the south end of Camorta Island and between them is the fine landlocked harbor of Nancowry (sec. 8C-13).

A 12-fathom shoal lies about 4 3/4 miles off the west coast of Camorta Island in position 8°06'28"N., 93°23'37"E.

The northeast coast of Camorta Island has not been closely examined. The southeast side of the island is separated from Trinkat Island by Beresford Channel. The east entrance of Nancowry Harbor lies between the southeast end of Camorta Island and the northeast end of Nancowry Island. The approach to this entrance leads through Beresford Channel.

SHOAL BANKS.—The unexamined 11-fathom shoal, located about 6 miles north-northwestward of Horace Point, the north extremity of Camorta Island, has been mentioned in section 8C-7.

A coral bank, with depths of 14 to 15 fathoms, lies about 6 miles east-northeastward of Horace Point. A similar bank, with depths of 13 to 20 fathoms, lies about 10 miles south-eastward of the same point.

TIDAL CURRENTS.—The tidal currents off the east coast of Camorta Island, between a position about 2 miles west-northwestward of the northwest extremity of that island and a position between the entrances of Expedition and Nancowry harbors, set southward on the rising tide and northward on the falling tide. The northgoing current, at springs, attains a rate of 3 knots at a distance of 2 to 3 miles from the coast. The southgoing current attains a rate of 3/4 knot to 1 1/4 knots. At neaps the northgoing current attains a rate of 3/4 knot to 1 1/4 knots and the southgoing current a rate of 1/4 to 3/4 knot.

Tide rips occur frequently at springs in various places all along the coast at variable distances offshore.

8C-10 WEST COAST.—The west coast of Camorta Island, between Horace Point and the village of Koi-hoa, nearly 3 3/4 miles southwestward, is fringed by reef to a distance of 1/2 mile. From the village the coast trends southwestward for 1 1/4 miles and thence southward for about 7 1/2 miles to Cave Point, the north entrance point of Expedition Harbor. Dring Harbor, which can only be entered by boats, is located about 2 1/4 miles northward of Cave Point.

The coast, between Satellite Point, the south entrance point of Expedition Harbor, and Reef Point, the south extremity of the island, is fringed by a comparatively narrow reef. The latter point forms the north entrance point of the west entrance of Nancowry Harbor.

DANGERS.—Perseus Reef extends about 3/4 mile westward from the northwest extremity of the island. A spit, as defined by the 10-fathom curve, extends about 2 miles in a northwest by westerly direction from the northwest extremity of the island. The reef, which extends 3/4 mile offshore south-south-eastward of this point, gradually narrows.

Sanderson Rock, over which there is a depth of 5 feet, is located about 2 1/4 miles northwestward of the entrance of Dring Harbor. The rock lies near the west extremity of a spit, with depths of 3 to 10 fathoms over it, which extends 1 1/3 miles offshore from a position about 3 3/4 miles south by eastward of the northwest extremity of the island.

A rocky shoal, with a least depth of 27 feet, lies 1/2 mile offshore in a position about midway between the entrances of Dring and Expedition harbors.

ANCHORAGES.—Temporary anchorage can be taken almost anywhere off the west coast of Camorta Island, northward of Expedition Harbor, in depths of 10 to 20 fathoms, poor holding ground. Vessels anchoring southward of the harbor are advised to anchor in 20 fathoms.

Vessels can anchor in 7 to 9 fathoms off Koi-hoa village, about 1 mile offshore. This anchorage is not protected from the Southwest Monsoon by Perseus Reef.

Vessels can anchor off the entrance of Dring Harbor in 9 1/2 fathoms, about 2/3 mile from the south entrance point, with that point bearing 089° and in range with a 209-foot hill, which is steep on its northeast side, and which is located near the head of the harbor. This is considered to be the best anchorage off this coast as there is little or no current.

8C-11 EAST COAST OF CAMORTA ISLAND.—From the northeast point of Camorta Island, located about 1 1/2 miles eastward of Horace Point, the east coast of the island curves south-southwestward and thence south-southeastward in a wide bight for about 8 1/2 miles, and thence southward for 3 1/2 miles to Naval Point. This point forms the

southeast extremity of the island and the north entrance of the east entrance of Nancowry Harbor. This entire stretch of coast is fringed by a reef that extends up to 1 mile offshore, except off Moshott Village where it extends up to 1 1/4 miles offshore. The village is located on the north side of a bight in a position about 4 miles south-southwestward of the northeast point of the island. The coastal reef is readily seen under favorable conditions of light.

CAUTION is necessary when approaching the coast between the northeast point of Camorta Island and the north entrance of Beresford Channel as this area has not been closely examined.

TRINKAT ISLAND, which lies between 1 1/2 and 2 1/2 miles eastward of the south part of Camorta Island, is separated from that island to the westward and northwestward by False Bay and Beresford Channel. Trinkat Island is low, level and has many coconut palms. An extensive reef fringes the shores of the island. Morrel (Morrell Point), the south end of the island, is located about 2 1/2 miles eastward of the southeast extremity of Camorta Island. A BEACON stands on Morrel Point.

BERESFORD CHANNEL is entered from southward through False Bay. The shore on each side of the channel is fronted by reefs and shoals that extend almost 3/4 mile offshore. A number of shoals, with depths of 3 to 6 fathoms, lie in the middle of the south part of the channel. Eastern Shoals and the dangers in the south entrance of the channel are described in section 8C-14). The channel on each side of Middle Reef, which lies about 3 1/2 miles north-northwestward of Morrel Point, is about 200 yards wide and has depths of 4 to 12 fathoms. The area northward of the northwest end of Trinkat Island has not been closely examined.

EXPEDITION HARBOR AND GRAND HARBOR

8C-12 EXPEDITION HARBOR is landlocked, and together with Grand Harbor opening off it to the northeastward, is of considerable size. A low, narrow peninsula separates Expedition Harbor from Nancowry Harbor to the southward. The entrance of Expedition Harbor lies between Cave Point

and Satellite Point, about 700 yards south-southeastward.

The south and east sides of the harbor are indented by coves, fringed with reefs and mangroves. Hoau Village is located about 600 yards east-southeastward of Edgumbe Point. The latter point is located a little over 1 mile northeastward of Satellite Point. The coast, from Edgumbe Point, trends eastward and northward to Edye Point, about 5/6 mile north-northeastward, the south entrance point of Grand Harbor.

Wasp Point lies about 1/4 mile southeastward of Cave Point and forms the inner entrance point of the harbor. The coast, from Wasp Point, trends north-northeastward for 2/3 mile to Devils Point, thence northward and northeastward for about 1 1/2 miles to the north entrance point of Grand Harbor. A conspicuous palm tree stands about 200 yards northwestward of this point.

Grand Harbor is entered between Edye Point, the north extremity of the promontory separating Grand Harbor from Expedition Harbor, and a point about 700 yards northward. The harbor extends in a north-south direction for about 2 miles. Headlam Creek and Wrights Creek indent the east shore. A prominent palm tree, standing at an elevation of 178 feet, stands near the north entrance point of the latter creek. The bay at the north end of the harbor is foul.

CHANNELS—DANGERS.—Coral patches, which dry 4 feet, lie 400 yards southwestward and 300 yards south-southeastward of Cave Point. The 6-fathom curve lies about 700 yards south-southwestward and 550 yards southward of Cave Point.

A channel, about 100 yards wide and having depths of over 10 fathoms, forms the inner entrance of Expedition Harbor, between the reefs fringing Wasp Point and Satellite Point. The channel passes about 100 yards northward of the latter point.

The north edge of a reef, with depths of less than 6 feet, lies about 1/2 mile east by northward of Satellite Point. This reef extends about 800 yards northward from a position about 1/2 mile southeastward of Satellite Point. Reefs and foul ground extend 1/4 mile west-southwestward from Edgumbe Point.

Middle Reef, an extensive drying reef, lies in the middle of the fairway, abreast Devils Point. A channel, about 200 yards wide and

having depths of 41 feet, leads between the southeast end of Middle Reef and the reef fringing Edgumbe Point.

A reef, that dries 3 feet, extends 400 yards southeastward from Foul Point, located about 1/2 mile northeastward of Devils Point. A channel, about 200 yards wide and having a least depth of 13 fathoms, leads between the southwest end of this reef and the north end of Middle Reef.

Grand Harbor has depths of 4 to 8 fathoms in its middle part. The whole shore is lined with mangroves. Reefs and foul ground extend up to 600 yards off the salient points.

ANCHORAGE.—Vessels can anchor in 10 fathoms, mud, with Devils Point bearing 340° distant 700 yards. Vessels intending to make a long stay are advised to do so in Nancowry Harbor because of the swarms of mosquitoes which infest this anchorage.

DIRECTIONS.—Vessels wishing to enter Expedition Harbor are advised to wait until the sun is high, and if possible to enter at low water, when all fringing reefs and dangers will be visible. Vessels approaching from northward or southward should keep at least 1 mile off the coast until abreast the entrance. When Hoau village opens out in the entrance and bears 071°, vessels can enter on this bearing, taking care to avoid the reefs on either side of the channel. When Devils Point bears 000°, vessels can alter course to the north-northeastward for the recommended anchorage.

Vessels not having local knowledge should not proceed above Devils Point into Grand Harbor, unless the north end of Middle Reef and the southwest end of the drying reef fringing Foul Point are clearly identifiable.

NANCOWRY HARBOR AND APPROACHES

8C-13 NANCOWRY HARBOR lies between the south coast of Camorta Island and the north coast of Nancowry Island. Both coasts are deeply embayed. The harbor is spacious and almost land locked. Nancowry Island is 535 feet high and densely wooded. Nancowry Harbor has a west and an east entrance, through either of which a vessel of deep draft may pass, during either monsoon, to take anchorage sheltered in all weather. Both entrances are readily identifiable from the

offing. The harbor consists of four bays: Satellite Bay and Fort (Octavia) Bay, on the north side, and Wasp Bay and Spiteful Bay on the south side.

WEATHER.—The climate in Nancowry Harbor is hot and humid. Malaria is prevalent.

TIDAL CURRENTS.—The tidal currents set eastward on the rising tide and westward on the falling tide. These currents attain considerable strength in the entrances, but are very weak inside the harbor. The tidal currents run especially strong through the west entrance channel between Man Point and Indian Point.

DEPTHS.—The depths in the west entrance fairway are over 10 fathoms; the depths in the east entrance are 6 to 23 fathoms. The depths at each of the three recommended anchorage positions is about 12 fathoms.

WEST ENTRANCE OF NANCOWRY HARBOR.—The west entrance of the harbor lies between Reef Point (sec. 8C-10) and Man Point, about 1/4 mile east-northeastward, on the north, and Burleigh Rock, about 550 yards southeastward of Reef Point, and Indian Point, on the south. The latter point, which forms the northwest extremity of Nancowry Island, is located about 400 yards northeastward of Burleigh Rock. The west entrance can be made out from distances up to 5 miles by a high ridge of hills and the trend of the coast inward to form its south side. Reef Point has a white-washed mark on it and would otherwise be very difficult to identify. This mark, however, cannot be relied upon. Man Point is also difficult to identify.

DEPTHS—DANGERS.—There is a least depth of 10 fathoms in the fairway of the entrance channel which is about 200 yards wide between the dangers on either side.

Northbrook Patch, located 1/4 mile south-southwestward of Reef Point, has a least depth of 1 3/4 fathoms. Shoal patches lie between it and the coast westward of the point.

Burleigh Rock, 24 feet high and having a wooded summit, is connected with the coast southeastward by a reef. Foul ground extends about 150 yards northwestward and 100 yards northward from the rock.

8C-14 APPROACHES TO EAST ENTRANCE OF NANCOWRY HARBOR.—The approach to the east entrance lies between

Morrel Point (sec. 8C-11), the south extremity of Trinkat Island, on the northeast, and Laire Point and Reid Point, on the southwest. The latter points are located on the northeast coast of Nancowry Island, a little over 2 miles southwestward and a little under 2 miles, west-southwestward, respectively of Morrel Point. A BEACON stands on Reid Point. Trinkat Island, described in section 8C-11, is readily distinguished from Camorta Island, which is higher and more open.

DANGERS.—The coast, between Laire Point and Reid Point, is fronted by an extensive reef which extends up to 1/2 mile offshore. The edge of this reef, except at high water and on exceptionally calm days, is marked by breakers.

A shoal, with a least depth of 2 3/4 fathoms, lies on the edge of the shore bank, as defined by the 5-fathom curve, about 800 yards east-northeastward of Reid Point. A 5 1/4-fathom patch lies near the center of the channel in a position about 1/2 mile northeastward of the same point.

Eastern Shoals, a large shoal area as defined by the 6-fathom curve, extends from 1 mile south-southwestward to about the same distance west-southwestward of Morrel Point. Its west limit lies about 1 mile east-northeastward of Reid Point.

The dangers northward of an imaginary line joining Naval Point and Morrel Point have been described with Beresford Channel in section 8C-11.

EAST ENTRANCE OF NANCOWRY HARBOR.—The east entrance lies between Naval Point, on the north, and the northeast coast of Nancowry Island between Reid Point and Mayo Point, a little over 1 mile westward, on the south. A BEACON stands on Mayo Point.

DEPTHS—DANGERS.—The entrance channel, which is about 300 yards wide between the dangers on either side, has a least depth of 6 fathoms. Naval Point is fringed by reefs. Shoal ground, as defined by the 5-fathom curve, extends up to 650 yards east-southeastward and about 450 yards southward from the point.

A shoal bank, as defined by the 5-fathom curve, fronts the coast between Reid Point and Mayo Point. This shoal bank extends up to 1/4 mile northward from Jub Point, which

lies midway between the above points. Shoal ground, as defined by the 3-fathom curve, extends about 350 yards north-northeastward, northward, and north-northwestward from Mayo Point.

A detached 4-fathom shoal lies 700 yards northwestward of Reid Point, close off the above shoal bank.

BEACON.—A white iron framework beacon, 17 feet high and surmounted by a white ball, stands about 350 yards southward of Naval Point. It marks the edge of the fringing reef.

A beacon stands on the fringing reef, about 1 mile northward of Naval Point.

8C-15 WEST PART OF NANCOWRY HARBOR.—WASP BAY, which forms the southwest part of the harbor, lies between the west entrance and an imaginary line drawn from Easter Point, located a little over 1 mile north-northeastward of Man Point, and Leda Point, about 1 1/4 miles east-northeastward of Easter Point. A point, located nearly 3/4 mile north-northeastward of Man Point, has a perforated rock at its extremity and a small palm tree on it. Itoe village, located on the east shore of the bay in a position about 1/2 mile southward of Leda Point, serves as a good mark.

DEPTHS—DANGERS.—Wasp Bay has depths of over 10 fathoms in its middle part. Some dangers and irregular depths are found in the west part of Wasp Bay. A shoal, with a least depth of 1 1/4 fathoms, lies 400 yards offshore in a position about 950 yards north-northeastward of Man Point. A shoal, with a least depth of 5 1/4 fathoms, lies about 7/10 mile northeastward of the same point. Foul ground, with depths of less than 6 fathoms, extends 1/4 mile southeastward and 1/2 mile east-northeastward from Easter Point.

A rock that dries 4 feet lies in the east part of the bay a little over 1 mile south-southwestward of Leda Point and about 700 yards offshore. Shoals, with depths of 2 3/4 to 6 1/2 fathoms, lie between this rock and the shore reef.

Alfrey Shoal, having a depth of 5 1/4 fathoms and lying nearly in midchannel, is located a little over 1/2 mile southwestward of Leda Point.

SATELLITE BAY, which forms the northwest part of Nancowry Harbor, is entered

from southeastward, between Easter Point and Alfred Point, about 1 1/4 miles north-eastward.

DEPTHS—DANGERS.—A deep channel, about 1/4 mile wide, leads between the west side of Alfrey Shoal and the east side of the foul ground that extends 1/2 mile east-northeastward from Easter Point. Depths of 9 to 17 fathoms are found in the outer part of the bay.

Satellite Patch, which is located about 3/5 mile southwestward of Alfred Point, has a least depth of 2 1/4 fathoms. A 3 1/2-fathom patch lies about 200 yards southward of this patch, and shoal patches, with depths of 3 to 6 fathoms, lie between Satellite Patch and the coast to northward and northwestward.

Shoal ground, as defined by the 6-fathom curve, extends 600 yards south-southwestward from Alfred Point and 1/4 mile northwestward and northward from Leda Point.

BEACON.—A beacon, 6 feet high, stands on the reef fringing the west side of Leda Point in a position about 400 yards westward of that point.

8C-16 EAST PART OF NANCOWRY HARBOR.—FORT (Octavia) BAY, the northeast part of Nancowry Harbor, is entered from southward between Naval Point and Alfred Point, about 1 1/2 miles westward. A disused watch tower stands about 200 yards northwestward of Naval Point. Ray Point, located 1/2 mile west-northwestward of Naval Point, can be identified by two radio masts located 300 yards to the northeastward. Battery Point, located 300 yards northwestward of Ray Point, can be identified by a conspicuous clump of casuarina trees about the same distance northward. A flag staff is located 3/10 mile west-northwestward of Naval Point.

DEPTHS—DANGERS.—Depths of 8 to 13 fathoms are found in the outer part of the bay. A **WRECK**, with a depth of 8 fathoms, lies about 1/3 mile westward of Ray Point.

Reefs fringe the shores of the bay to a distance of 300 yards. A shoal, with a least depth of 31 feet, lies nearly 1/2 mile east-northeastward of Alfred Point.

SPITEFUL BAY, the southeast part of Nancowry Harbor, is entered between Mayo Point and Leda Point, about 4/5 mile west-southwestward. Enounga Village is located

on the east shore of the bay, about 1/4 mile southward of Mayo Point.

DEPTHS—DANGERS.—Depths of 9 to 13 fathoms are found in the outer part of Spiteful Bay. Reefs and shoals fringe the west side of the bay to a distance of 1/4 mile.

A 3-fathom coral patch lies nearly in the center of the entrance of the bay in a position about 700 yards east-northeastward of Leda Point.

A mudbank, which dries 3 feet, extends out some distance from the head of the bay. Some detached reefs lie in the inner part of the bay.

8C-17 ANCHORAGES.—There is an outer anchorage about 1 mile eastward of Naval Point. The depth is 12 fathoms and the holding ground is good. A long scope of chain is advisable as the squalls off the land are sometimes heavy. The anchorage is otherwise sheltered.

The outer part of Fort Bay is clear of dangers, except for the before-mentioned wreck, and affords excellent anchorage in 12 fathoms, mud, with the conspicuous clump of casuarina trees bearing about 075°, distant 700 yards. This anchorage is well sheltered and little current is experienced. It is somewhat exposed to the sea breezes.

Anchorage can be taken in the middle of the entrance of Spiteful Bay in 12 fathoms. This anchorage is somewhat open to the sea breezes.

Anchorage can be taken in the fairway of the east entrance of Nancowry Harbor, in convenient depths, on a line joining the stone jetty and the village of Mala, located about 300 yards south-southwestward of Mayo Point.

DIRECTIONS—WEST ENTRANCE.—Vessels should approach the west entrance from the southwestward in order to avoid the dangers extending south-southwestward from Reef Point and terminating in Northbrook Patch (sec. 8C-13). The conspicuous clump of casuarina trees near Battery Point (sec. 8C-16) bearing about 036° and open southeastward of Man Point, leads southeastward of Northbrook Patch. When Reef Point bears 000°, it should be steered for on that bearing until Burleigh Rock bears 090°. Thence the course should be gradually altered to the northeastward, avoiding the foul ground which extends northwestward from Burleigh Rock,

and course shaped to pass midway between Man Point and Indian Point. In passing between these points, vessels should have good steerage way as the currents are strong and there are many eddies.

After passing Man Point, the course should be altered to 055° with Itoe village ahead on that bearing. When Easter Point bears 305°, the course should be altered northward so as to pass between the west side of Alfrey Shoal and the east side of the foul ground that extends 1/2 mile east-northeastward from Easter Point.

When Mayo Point bears about 080° and is open northward of Leda Point, the course should be altered eastward and the radio masts northeastward of Ray Point should be steered for on a course of 055°. This course leads between the dangers extending from Leda and Alfred Points and into Fort Bay where anchorage can be taken as convenient.

DIRECTION—EAST ENTRANCE.—Vessels approaching the east entrance should keep Reid Point bearing 280° and in range with Alfred Point. This course leads southward of Easter Shoal. When the right tangent of Trinkat Island bears 034°, the course should be altered northward to about 310° towards a red cliff (with a mangrove clump close eastward of it), located on the east side of Camorta Island, about 1 mile northward of Naval Point. This course leads northeastward of the reef fronting the coast between Laire and Reid Points.

When Mayo Point bears 261°, the course should be altered to 268° to pass about 150 yards southward of the beacon on the reef fringing Naval Point, keeping clear of the shoals extending northward from the coast between Jub and Mayo Points. When clear of Mayo Point, course can be altered to northward and anchorage taken, as convenient, in Fort Bay.

NANCOWRY HARBOR (8°02'N., 93°32'E.)

8C-18 FACILITIES.—Nancowry Harbor, although providing excellent shelter for all types of vessels, has few facilities. The residence of the Government Agent is located about 1/4 mile west-northwestward of Naval Point.

BERTHS.—A stone jetty, with a wooden extension at its head, is located about 600

yards west-northwestward of Naval Point. The jetty is about 390 feet long, and the wooden extension projects about 120 feet south-southwestward from the head of the stone jetty. The depths alongside the wooden extension are about 13 feet at its head, decreasing to about 2 feet at the east end.

A wooden jetty, 235 feet long and 20 feet wide, projects in a westerly direction from a position about 300 yards south-southwestward of Mayo Point.

SUPPLIES.—Fresh provisions can be obtained in very limited quantities.

COMMUNICATIONS.—There is occasional communication by ship with Port Blair and Indian ports.

CENTRAL GROUP OF NICOBAR ISLANDS (CONTINUED)

8C-19 KATCHALL ISLAND is separated from Camorta and Nancowry Islands to the northeastward by Revello Channel, which is about 3 3/4 miles wide and apparently free of dangers. Katchall Island is densely wooded and attains a height of 835 feet in its middle part.

DEPTHS off the west coast of the island are very irregular. Some 9- and 10-fathom patches lie up to 4 miles off this coast.

WEST SIDE OF ISLAND.—**WEST BAY** deeply indents the west side of the island, but is foul in its inner part. Vessels with local knowledge can **ANCHOR** in 9 fathoms about 1 mile south-southwestward of its northwest entrance point. It is reported that a southwesterly swell sets into the bay on occasions during the Northeast Monsoon, and that tidal currents attain a rate of 2 knots across the entrance.

SOUTH BAY indents the south side of the island, westward of its south end. The bay should not be entered because of the rocks and foul ground that encumber it. It was reported (1945) that Cape Albany, the south end of the island, had extended 400 yards farther southward than charted.

EAST BAY, backed by steeply rising ground and by Katchall Summit, 812 feet high, indents the northeast side of the island. Numerous rocks and foul ground encumber the bay and lie up to 1 1/2 miles off its shores. The depths in the bay vary from a few feet to more than 20 fathoms.

HOIN-IPOH BAY slightly indents the east coast of Katchall Island, about 3/4 mile eastward of the south end of East Bay. ANCHORAGE can be taken in 12 to 13 fathoms, with Hoin-ipoh Village bearing 259°, distant 1/2 mile. This bay is often visited by trading vessels.

REVELLO CHANNEL is deep. A reef of drying rocks extends about 1 mile south-eastward from Cape Connaught, the south extremity of Nancowry Island. A 7-fathom shoal lies in the middle of the south entrance of the channel in position 7°55'48"N., 93°30'E.

SOMBRERO CHANNEL

8C-20 SOMBRERO CHANNEL separates the central and south groups of the Nicobar Islands. The channel is 30 miles between Cape Albany and Sombrero Point, the north extremity of Little Nicobar Island. The depths in the channel are irregular, but there is deep water in midchannel.

TIDAL CURRENTS set strongly through the channel. See section 8-4.

DANGERS-ISLETS.—A patch, with a depth of 12 fathoms, yellow clay, lies in the west approach to Sombrero Channel in a position about 12 miles west-southwestward of Cape Albany. Shoal patches may exist in this area.

A detached coral bank, which shoals to 9 fathoms at its north extremity, about 3 miles south-southeastward of Cape Albany, occupies an area roughly a mile long and 5 miles wide in the north part of Sombrero Channel. This bank, on which the depths elsewhere are 11 to 17 fathoms, is reported to be extending westward.

Miroe (Meroe) Island, which is low and small, is located about 10 1/2 miles west-northwestward of Sombrero Point.

Trak Island is located about 5 miles west-northwestward of Sombrero Point. Treis Island is located about 1 mile southeastward of Trak Island. These islands are small, reef-fringed and surrounded by sunken rocks. A rock, over which there is less than 6 feet, lies about midway between Treis Island and Sombrero Point.

SOUTH GROUP OF NICOBAR ISLANDS

8C-21 LITTLE NICOBAR ISLAND is cov-

ered with dense forest. Mountains rising from swampy lowland attain, in Empress Peak, a height of 1,420 feet, and in Mount Deoban, a height of 1,428 feet. These peaks are located about 5 1/2 miles south by eastward and 7 miles south by westward, respectively, of Sombrero Point.

WEST COAST.—The northwest coast between Sombrero Point and Pahua, about 6 miles southwestward, and the west coast thence to Cape Edinburgh, about 7 1/2 miles southward, is fringed by reef to a distance of 1/2 mile. The latter point forms the south end of the island.

Pulo Milo, an islet fringed with reef, is located in an extensive bight formed between Sombrero Point and Pahua, about 2 1/2 miles southwestward of the former point. Two 3-fathom patches lie in the channel between Pulo Milo and the coast of Little Nicobar Island, about 3/4 east-northeastward and 2/3 mile east-southeastward, respectively, of the north end of Pulo Milo.

A 10-fathom patch was reported (1964) to lie about 13 miles westward of the west end of Pulo Milo.

ANCHORAGE can be taken in the channel between Pulo Milo and Little Nicobar Island in 9 to 13 fathoms, sand and coral. The channel fairway is about 700 yards wide and is fairly well sheltered.

NORTHEAST COAST.—ILEYA (7°25'N., 93°42'E.), a small village, is located about 1 1/2 miles south-southeastward of Sombrero Point. A sandy beach is formed both northward and southward of the village. A small drying patch lies close eastward of the village.

Menchal Island lies about 1 1/4 miles off the northeast coast of Little Nicobar Island in a position about 4 miles southeastward of Sombrero Point. Depths of 6 1/2 fathoms have been obtained in the channel between the islands, but there are probably less depths.

ANCHORAGE can be taken by vessels with local knowledge, in 6 to 7 fathoms, about 1/2 mile southwestward of Menchal Island. This is a fair weather anchorage. The tidal currents are reported to be strong, especially at springs.

SOUTHEAST COAST.—The southeast coast of Little Nicobar Island, which forms the northwest shore of St. Georges Channel, is comparatively steep-to.

GREAT NICOBAR ISLAND

8C-22 GREAT NICOBAR ISLAND, the southernmost and largest of the Nicobar Islands, is well wooded and fertile. Its north extremity lies about 10 miles south-southeastward of Menchal Island (sec. 8C-21). Its northwest extremity lies about 3 3/4 miles south-southeastward of the south end of Little Nicobar Island.

Great Nicobar Island attains a considerable height throughout its length and has three well-defined ridges, the mountains of which are steep-sided and covered with dense jungle. Mount Thuiller, located on the main ridge in the northeast part of the island, attains a height of 2,105 feet. The main ridge runs southward from Mount Thuiller, parallel with the east coast, to a position near South Bay, close to the south end of the island. A second ridge extends westward from Mount Thuiller and attains a height of 1,835 feet. A third ridge, with a height of 1,333 feet, extends southwestward, from a position near the center of the main ridge, across the island. Between these ridges there are a number of broken ridges, which, for the most part, run northward and southward.

CAUTIONS.—The island appears to be fringed by a reef along the greater part of its coastline. The edge of the submarine plateau from which the island rises has not been clearly defined. It apparently extends a considerable distance westward from the coast. The west coast of the island, which is fully exposed to the Southwest Monsoon, has not been closely examined. Vessels are advised to use caution when approaching the island.

A 10-fathom shoal lies about 19 miles southwestward of the south end of Great Nicobar Island.

NORTH COAST OF GREAT NICOBAR ISLAND

8C-23 Between the northwest point (7°11' N., 93°41'E.) of Great Nicobar Island and the northwest entrance point of Ganges Harbor, nearly 5 miles east-northeastward, the coast is slightly indented and is fringed by a reef. A 3 1/2-fathom shoal lies about 1 1/2 miles off the north coast of Great Nicobar Island in position 7°13'42"N., 93°43'38"E.

KONDUL ISLAND lies about 1 mile off the middle part of this bight. The north side of

the island is high and rocky; the maximum height is 400 feet.

Caution is required in approaching Kondul Island and the adjacent coast as unknown dangers may exist. It was reported (1921) that a depth of 6 fathoms was obtained about 1 1/2 miles westward of Kondul Island, and that shoals appeared to extend over a considerable adjacent area. A rock, with 6 feet over it, is located about 2/3 mile west of the south end of the island.

KONDUL HARBOR is formed by the south side of Kondul Island and a bight in the northwest coast of Great Nicobar Island. A police radio station is located in this vicinity and is in regular communication with Port Blair (sec. 8B-54).

A 2 1/2-fathom shoal, which has not been closely examined, lies about 3/4 mile south-southeastward of the southeast end of Kondul Island.

GANGES HARBOR, which is formed by a bight in the north coast of Great Nicobar Island, is entered between a point, located about 2 3/4 miles eastward of the south end of Kondul Island, and a point about the same distance east-northeastward. A spit, with a depth of 21 feet at its outer end, extends nearly 1 mile west-southwestward from the east entrance point of the harbor. A reef, which fringes the west entrance point, extends nearly 1/2 mile north-northeastward from that point.

A coral head, having a depth of less than 6 feet, lies about 1 1/2 miles northward of the east entrance point of the harbor. The position of the coral head is approximate.

A shoal, on which there are two rocks having depths of less than 6 feet, lies nearly midway between the entrance points. There are considerable depths between this shoal and the dangers extending from either entrance point.

KABRA ISLAND, 309 feet high, is located nearly 3 miles northward of Murray Point, the north extremity of Great Nicobar Island. A 2 1/2-fathom shoal lies in the channel between the two islands in a position about 1 1/4 miles northeastward of Murray Point. Its position is doubtful.

ANCHORAGES.—Anchorage can be taken off either the east side or the west side of Kondul Island, according to the direction of the prevailing wind. The eastern anchorage has a depth of 7 fathoms at a position about 1/2 mile offshore. Depths of 10 to 12 fathoms are