the approaches to the low coast, except at the change of the seasons. Fog, off the coast and in the river, occasionally occurs during the change of seasons, but it usually lifts during the forenoon. In general, thick weather can be expected during the Southwest Monsoon.

At the anchorage off Mungla, vessels are required to have steam ready for meeting any emergency during the period of Nor'-westers, March through May, and during the Southwest Monsoon. Nor'westers are usually directional as their name implies; they are storms accompanied by heavy rain and high winds with velocities up to 30 to 40 knots. Nor'westers give about 2 or 3 hours notice and vessels are usually advised in the day's weather forecast. The Southwest Monsoon prevails from about May to September.

See also section 4-3.

TIDES—TIDAL CURRENTS

4B-13 Tides in the Pussur River are semidiurnal. High water over the bar occurs about one hour before predicted high water for the entrance of the river.

Tide gauges stand on the river banks at Hiran Point, abreast Sundar Kota about 9 miles above Akram Point, and about 2 1/2 miles below Chalna.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Pussur River Entrance (Jefford Point): MHWS 10.1 feet, MLWS 2.2 feet; MHWN 7.7 feet, MLWN 4.5 feet. *Pakistan Chart 2.

Tidal heights vary with the season, being lower in February and March, and higher July through November.

Chalna Reach: MHWS 10.6 feet, MLWS 3.0 feet; MHWN 8.8 feet, MLWN 5.6 feet. *B.A. Chart 732.

Seasonal changes in tidal heights in the river may be greater than those in the entrance.

TIDAL CURRENTS.—At the Fairway Buoy (21°29'N., 89°35'E.), the ebb current sets about south-southeastward and the flood current sets about north-northwestward. The velocity of the current is about 2 knots at spring tides during the Northeast Monsoon. At the time of the Southwest Monsoon, the ebb current is stronger and the flood current is correspondingly weaker.

In Zulfiquar Channel the ebb current flows at a velocity of about 3 knots at springs. The currents turn about one hour after high and low water in the entrance of the Pussur River. Extensive rips and eddies mark the edges of Sarwar Sand and Dubla Shoal (sec. 4B-14).

At the anchorage off Mungla, the ebb current has a velocity of about 4 knots at springs. The currents turn about 4 1/2 hours after high and low water in the entrance.

A report states the currents turn in Zulfiquar Channel about 2 hours and at the anchorage off Mungla about 3 hours, respectively, after high and low water in the entrance. The velocity of the ebb current was reported to be 6 knots at springs at the anchorage off Mungla.

DEPTHS—DANGERS—DRAFTS

4B-14 A BAR, about 5 miles wide with a least depth of 15 feet (chart datum 1963), lies in the approach to the Pussur River between 5 and 10 miles southward of the entrance.

An early 1965 report states the least charted depth over the bar is 16.3 feet. Maximum crossing draft can be computed as follows: 16.3 feet–3.5 feet+height of high water where 3.5 feet represents normal minimum water under keel. This formula is used for maximum river drafts (fresh-water) published quarterly by Chalna Port Authorities. Draft permitting, the bar can be crossed anytime day or night.

When crossing the bar during the Southwest Monsoon, vessels should have not less than 4 feet of water under the keel; their speed should not exceed 12 knots. During the Northeast Monsoon, a minimum clearance of 3.5 feet under the keel is considered a safe margin for crossing the bar.

The best time to cross the bar inbound is about 1 hour before time of high water in the entrance. Outbound passage of a vessel should be timed to cross the bar during the last 45 minutes of the flood tide. During the first stage of the ebb tide the river level drops very fast.

The depths over the crossings inside the river entrance vary between 19 and 23 feet. Vessels with fresh-water drafts of 24 feet, and during spring tides in September, Octo-

ber, November and December, vessels with drafts of 24 1/2 to 25 feet can enter the river, and proceed as far as the anchorage off Mungla, about 48 miles above Jefford Point. Vessels up to 2,000 tons with a maximum draft of 16 feet can proceed upriver to Khulna, about 25 miles above Mungla Anchorage.

Numerous fishing boats and nets have been reported in the vicinity of the river entrance.

Shoals with depths of less than 3 fathoms are charted on either side of the approach to the river entrance and on the east side extend about 11 miles southward from Jefford Point. On the west side the shoal extends about 15 miles south-southeastward from West Point (21°43'N., 89°24'E.); in heavy weather the sea breaks over the outer end of this shoal. The bar, which fronts the river entrance, joins the above shoals about 3 to 4 miles northward of their outer edges.

SARWAR SAND, awash at high water, lies on the west side of Zulfiquar Channel with its north edge about 4 1/2 miles southward of Hiran Point. A spit (South Sarwar Sand) with depths of 1 fathom and less extends about 1 1/4 miles southward from Sarwar Sand. An unnamed sand, which dries in patches, lies between Sarwar Sand and Hiran Point; this danger with its north edge about 2 1/2 miles southward of Hiran Point is also on the west side of Zulfiquar Channel.

DUBLA SHOAL, with depths of less than 1 fathom and patches which dry 1 to 3 feet, lies on the east side of Zulfiquar Channel between Jefford and Boar Points. It is about 3 miles in extent, north and south, with its south edge lying about 1 mile west-northwestward of Jefford Point.

PAVANGA SHOAL, with depths of less than 3 fathoms and an area near its center which dries to 1 foot, lies on the west side of Zulfiquar Channel; the shoal is charted as being about 5 miles in extent, north and south, with its south edge lying about 1 1/2 miles southwestward of Boar Point. Pavanga Shoal has been reported to be extending southward.

ASPECT—LANDMARKS

4B-15 The coastline in the vicinity of the entrance of the river is low; from the offing there are no distinctive marks. Land is not normally sighted until vessels are crossing the bar; the sandy and grass covered coast in the vicinity of Jefford Point can be seen at this time. The adjacent coast is covered with jungle. Reports indicate the entrance does not give a good radar return.

Jefford Point Light Structure can be seen in clear weather from the vicinity of the Fairway (Outer Bar) Light Float. The radiobeacon antenna, about 1 1/2 miles north-northwestward of Hiran Point and 6 1/3 miles northwestward of Jefford Point, is reported to be a good landmark when approaching the entrance. White dwellings stand in the vicinity of the radiobeacon.

NAVIGATIONAL AIDS

4B-16 The entrance of the river, between the approach to the bar and the central part of Zulfiquar Channel, is normally marked by light floats and light buoys. After the annual winter survey of the bar, the floating aids are moved to conform with the changes in the channel; replacement of aids is not always made.

During severe weather floating aids are liable to be shifted or missing; their charted positions cannot always be relied upon.

LIGHTS.—A light is shown from Jefford Point.

A light is shown from the north side of Sarwar Sand about 4 miles west-southwestward of Jefford Point Light.

A fixed red light is shown from the radiobeacon house about 6 1/3 miles northwestward of Jefford Point Light.

A light is shown from the west side of the river at the south end of the anchorage off Mungla. Two lights are shown from the east side of the river at the south end of the anchorage; these lights are on the south side of a river emptti int the Pussur River.

LIGHT FLOATS AND LIGHT BUOYS.—In 1965 the following floating lighted aids marked the entrance channel and dangers in Zulfiquar Channel in the approach to the anchorage off Hiran Point; distances and bearings are reckoned from Jefford Point Light Structure.

Fairway (Outer Bar) Light Float, painted red and equipped with a radar reflector, about 16 3/4 miles 172°; South Bar Lighted Buoy, red and white striped with a can topmark, about 12 1/4 miles 181°; a lighted

buoy, red and white checkered with a radar reflector, about 10 miles 190°; Pussur II Light Float, painted red and equipped with a radar reflector, about 7 1/2 miles 203°; North Bar (South Sarwar Sand) Lighted Buoy, red with a can topmark, about 5 miles 217°; Pussur III Light Buoy, painted red and equipped with a radar reflector, nearly 3 1/2 miles 247°; Dubla Lighted Buoy, black and white with a can topmark, about 2 1/2 miles 325° and moored on the west side of Dubla Shoal; the south side of Pavanga Shoal is marked by a lighted buoy, painted red with a can topmark, about 4 miles 331°; Pavanga Shoal is marked on its east side by a lighted buoy, painted red and equipped with a radar reflector, about 7 miles 345°.

BUOY.—A red and white checkered buoy is moored in the approach to the bar, about 15 1/2 miles 175° from Jefford Point Light Structure.

RIVER ABOVE AKRAM (SIPSAH) POINT.—The Pussur River between Akram Point and the anchorage off Mungla is marked with red can and red conical buoys. Red can buoys are to be passed on the port hand and red conical buoys on the starboard hand by inbound vessels, and vice versa by outbound vessels.

RADIO AIDS.—Hiran Point Radiobeacon (21° 49'N., 89°28'E.) was inoperative in 1965. Temporary service is furnished by radio station, call letters ASV1, located at the radiobeacon station near Hiran Point; the station will, upon request, send radio signals for vessels desiring to take radio bearings when approaching the Pussur River.

ANCHORAGES

4B-17 During the Northeast Monsoon, anchorage can be taken outside the bar in about 4 to 5 fathoms, good holding ground, about 1 3/4 miles northwestward of Fairway (Outer Bar) Light Float (21°28'32"N., 89°35'22"E.) or in deeper water of 7 to 8 fathoms about 3/4 mile northward of the same position.

Anchorage is afforded as required inside the bar in Zulfiquar Channel. A good berth, sheltered from the Southwest Monsoon, is in about 5 1/2 fathoms about 1 1/2 miles southeastward of Hiran Point. A berth with good holding ground, but less sheltered, can be obtained in 4 1/2 fathoms, about 1 1/2 miles northeastward of Sarwar Sand Light Beacon.

Because of Pavanga Shoal, a vessel should not anchor northward of 21°47'N.

PILOTAGE—PILOTS—INSTRUCTIONS

4B-18 Pilotage is compulsory for vessels of 200 tons and over for the Pussur River and is restricted to daylight hours. In 1965 pilots boarded and departed vessels off Hiran Point. In adverse weather, if boarding is impossible off Hiran Point, the pilot vessel will lead incoming vessels up to Akram Point where pilots will board in sheltered water. Pilot vessels are liable to be withdrawn without notice.

To ensure that a pilot will be waiting for a vessel on arrival, a vessel should notify the radio station or one of the pilot vessels at least 24 hours in advance of arrival off the entrance, giving ETA, fresh-water draft, vessel's length and speed available, and fresh water required. Messages should be addressed to "Port Director Khulna and Pussur Pilot Vessel." Messages should be sent via Khulna Radio Station (ASV) and Pilot Vessel ANSAR (AQFA) or Pilot Vessel MOEEN (AQEI) and Pilot Station (ASV1), which is located near Hiran Point. Vessels should time their arrivals at least 3 hours before daylight high water. The pilot vessel MOEEN is a large white tug with a buff stack. Khulna Radio maintains a continuous watch; the other stations maintain daily radio and radiotelephone watches during various 1/2 to 2-hour periods.

On approaching the outer bar, a vessel will receive instructions via radio from the pilot vessel giving navigational directions, anchoring information, time of getting underway if vessel is anchored outside the bar, and where the pilot will board the vessel.

DIRECTIONS

4B-19 The following directions for crossing the bar and proceeding to the anchorage off Hiran Point were received by a vessel and conformed to the positioning of the floating aids in early 1965.

From Fairway (Outer Bar) Light Float steer 325° for 5 miles to South Bar Lighted Buoy and 5 miles farther on course 325° to Pussur II Lighted Buoy, thence steer 002° for 6 miles to Pussur III Lighted Buoy and anchor

2 miles southeast of Hiran Point. Keep all above light floats and lighted buoys 1/2 mile on port hand; do not cross latitude of Hiran Point.

An early 1965 report states no dependence can be placed on the color of buoys. Color, shape, and even frequently failing buoy lights are of no great importance as all buoys are passed on the port hand, about 1/2 mile off, entering, and on the starboard hand, leaving, between the Fairway (Outer Bar) Light Float and Jefford Point.

Dubla Shoal Lighted Buoy should be passed to the westward by vessels entering and leaving.

Mariners bound for the Pussur River should verify the position and condition of the aids in the approach to the entrance, and where the pilot will board the vessel.

Vessels are required to display their signal flags (call letters) when entering port and while at the anchorage off Hiran Point awaiting a pilot.

REGULATIONS

4B-20 Quarantine.—The Port Director at Khulna is to be notified 24 hours in advance of vessel's arrival as to the state of health on board and vessel's last port of call. Radio pratique may be granted. A report states that health officials board vessels about 7 miles below Mungla (Chalna) Anchorage. The port health officer is stationed at Khulna.

Chalna Port Rules.—"Chalna Port Rules, 1964" are rules primarily for pilots and service organizations.

If repairs are to be made to a vessel at the anchorage and it requires the immobilization of the vessel, permission should be obtained from the port authorities.

MUNGLA (CHALNA) ANCHORAGE (22°28′N., 89°35′E.)

4B-21 FACILITIES.—MUNGLA ANCHORAGE, the lighterage port of Chalna, is an anchorage in the Pussur River about 66 miles from the outer bar light float and 9 miles below the town of Chalna. The port of Chalna is administered directly by the Central Government through the Port Director. Headquarters of the port are at Khalishpur adjoining the town of Khulna, the local railhead about 25 miles upriver from the anchorage. The port was opened in 1950 and was designed to relieve congestion in the East Pakistan port of Chittagong; also it provides an outlet for jute exports from the west part of East Pakistan. Other exports include nuts, timber, and gunnies. Chalna village consists of several huts where laborers live while working vessels at the anchorage.

MOORINGS AND DEPTHS.—The anchorage is 3 miles in length with depths of 19 to 45 feet. Several swing moorings (single mooring buoys) are available; one of the vessel's anchors is "hung off" and with the assistance of a mooring tug vessel's anchor chain is made fast to a buoy. Vessels anchor in midstream at nine additional anchorage berths; the holding ground is good.

To prevent dragging vessel's or buoy anchors when a strong ebb current is running, especially during Southwest Monsoon spring tides, it is advisable not to moor more than two large or four average-sized lighters alongside a vessel.

TUG.—There is a powerful tug at the port.

CARGO INFORMATION.—The shore staff attending a vessel have to remain on board and at least 6 to 8 persons have to be accommodated during vessel's stay in port. All cargo is handled in mid-stream using vessel's gear and large covered lighters, some of which are 300 feet long. A number of small open barges are also in service. Hazardous cargo can be discharged about 5 or 6 miles below the anchorage.

PROVISIONS.—Provisions of uncertain quality are obtainable in small quantities.

DECK AND ENGINE SUPPLIES.—Deck and engine supplies are obtainable in small quantities.

FUEL.—Facilities for the bunkering of fuel oil do not exist at this port; in an emergency a small quantity in drums may be transported from Khulna.

COAL.—Limited supplies of coal are obtainable.

WATER.—Water from Khulna can be obtained and is delivered by lighters equipped with pumping facilities. Quantities of up to a maximum of 150 tons can be supplied.

REPAIRS.—A shipyard at Khulna can handle some repairs to ocean vessels.

COMMUNICATIONS.—Radio station (ASV) is located at Khulna; radiotelephone communication is maintained between the signal station and the shipping agencies and port authorities at Khulna. The port is served by inland water transport which connects almost all the river points in the province and with the railroad at Khulna. Helicopter service to Dacca via Khulna has been reported to be available.

Mungla Signal Station.—A steel framework signal tower with a hut on top stands on the east bank of the river on the south side of the entrance of the creek Mungla Nala; a red and white banded radio mast stands close northward of the signal tower.

MEDICAL.—A small dispensary is maintained at Chalna; the nearest hospital is at Khulna.

OLD CHALNA ANCHORAGE

4B-22 Old Chalna Anchorage, about 9 miles above Mungla (Chalna) Anchorage, was formerly the site of the lighterage port of Chalna. This anchorage was found unsuitable in 1952; high freshets and strong eddies caused moored vessels to break adrift. Old Chalna Anchorage is no longer used by ocean vessels.

HARINGHATA RIVER (21°50'N., 89°57'E.)

4B-23 THE HARINGHATA RIVER, one of the principal outlets of the Ganges, has an estuary about 7 miles wide at the entrance. TIGER POINT (21°54'N., 89°53'E.) is on the west side of the entrance. The river passes through fertile land.

NAVIGATION.—The river is navigable by ocean vessels as far as Morrelgani, about 37 miles from the entrance, and throughout its entire course by the largest native boats. Navigation of the Haringhata is said to be easier than that of any other river at the head of the Bay of Bengal, as the river is free from tidal bores and mid-channel dangers.

The river should not be entered without local knowledge; lacking such knowledge, a pilot is always necessary.

TIDES—TIDAL CURRENTS.—Tides are semidiurnal and the river is tidal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Haringhata River Entrance (Tiger Point): MHWS 9.8 feet, MLWS 1.9 feet; MHWN 7.3 feet, MLWN 4.4 feet. *H.O. Chart 6170.

Tidal currents are reported to exceed a velocity of 4 knots at springs.

DEPTHS—DANGERS.—A bar, with a low-water depth of about 2 1/2 fathoms, fronts the mouth of the Haringhata.

ARGO FLAT, an extensive shoal area with depths of less than 3 fathoms, fronts the coast between Pussur (Passar) Point, about 3 1/2 miles east-southeastward of Jefford Point (21°44'N., 89°32'E.), and Landfall Point (21°48'N., 90°07'E.), on the east side of the entrance of the Haringhata River and located about 30 miles east-northeastward of Pussur Point. The flat extends up to 19 miles offshore and dries in patches for a distance of about 8 miles southward of Tiger Point; heavy breakers have been observed at the latter described area.

A heavy sea runs at the entrance during the Southwest Monsoon.

ANCHORAGE.—Anchorage is afforded at Morrelgani, where the river is about 1/4 mile wide; the anchorage is sheltered and has good holding ground.

MORRELGANI.—River steamers call at Morrelgani, a local trade center which is commercially important by reason of its position in a prosperous rice-producing area.

BARISAL.—Barisal, the headquarters of the Bakarganj District, is connected with Morrelgani by a series of rivers. River steamers make calls at these ports as well as Khulna and Narayanganj, establishing communication with Calcutta and Dacca. There is also sea communication with Patuakhali, about 20 miles southward of Barisal.

COASTAL FEATURES (CONTINUED)

4B-24 THE ENTRANCE OF RABNABAD CHANNEL lies about 8 miles east-northeastward of Landfall Point. The channel is narrow and has a least charted depth of 2 1/4 fathoms in its north part which lies between the westernmost Rabnabad Island and the mainland to the westward. After rounding the north point of the above Rabnabad Island (22° 03'N., 90°23'E.), this channel connects with the Ganges River through the Kajal and Tetulia Rivers, about which little knowledge is known. A stranded WRECK is charted on the east side of the entrance of Rabnabad Channel, about 11 miles 080° from Landfall Point.

An area between the south point of the easternmost Rabnabad Island and a position about

18 miles eastward has not been surveyed. Similarly, a large unsurveyed area lies northward of a line extending about 50 miles east-northeastward from the above south point to a position (22°10'N., 91°15'E.), about 6 miles eastward of the southeast point of South Hatia Island.

MEGHNA FLATS, shoals with depths of 3 fathoms and less, lie between the entrance of the Haringhata River and the entrance of the Shahbazpur River, about 60 miles northeastward of the former. These shoals extend seaward in a south-southwestward direction for distances up to 45 miles off the mouths of the Meghna River. Detached shoals are charted off the outer ends of these flats, some of which lie only 4 1/2 to 10 miles inside the 6-fathom curve.

D'APRES SHOAL (22°00'N., 91°09'E.), a drying sandbank, is on the east side of the entrance of the Shahbazpur River, nearly 14 miles southward of the southeast point of South Hatia Island.

4B-25 SANDWIP ISLAND is the easternmost and one of the largest of the numerous islands which lie between the entrances of the Meghna River. Numerous chars, the local term for low sand and mudbanks, also lie in the entrances.

Shoals, with depths of 3 fathoms and less, extend nearly 22 miles southward from South Hatia Island. Similar shoals are charted as extending about 15 miles southward and 26 miles south-southwestward, respectively, from the south extremity of Sandwip Island. A detached 3-fathom shoal is charted about 15 miles south-southeastward of the southeast point of South Hatia Island. Another detached 3-fathom shoal with a reported depth of 2 1/2 fathoms is charted 24 miles southward of the south extremity of Sandwip Island. A WRECK, with a depth of 1 1/4 fathoms, lies about 7 miles southward of the south extremity of Sandwip Island. A green conical buoy is moored close southeastward of the wreck.

TIDAL CURRENTS.—Near D'Apres Shoal the velocity of the tidal current is about 4 knots.

In depths of 5 fathoms and less there is always a swell during the first half-hour of the flood current.

About 40 miles southwestward of D'Apres Shoal the tidal current continues to run northward and northeastward for one hour after high water and south-southwestward and southwestward for 1 1/2 hours after low water. During spring tides the tidal currents set northward and southward and at neaps they gradually turn in a clockwise direction. Tidal currents setting more to the westward than the eastward are experienced during the fine weather season. The estimated velocity of the ebb current at springs is from 4 to 6 knots and at neaps about 2 1/2 knots.

MEGHNA RIVER

4B-26 THE MEGHNA RIVER discharges the main volume of the waters of the Ganges and Brahmaputra Rivers through its four principal mouths, the Tetulia, Shahbazpur, and Hatia Rivers and Sandwip Channel. The Brahmaputra joins the Ganges at Goalunda and the combined waters enter the Meghna River at Chandpur.

Tetulia River, unsurveyed flows between Dakhin Shahbazpur Island on the east and the Sundarbans mainland on on the west. The Shahbazpur River, which has not been closely surveyed, flows between the Hatia Islands group on the east and Dakhin Shahbazpur Island on the west. Hatia River passes between Sandwip Island on the east and the Hatia Islands group on the west. Sandwip Channel, between the Chittagong Coast on the east and Sandwip Island on the west is closed by sandbanks northward of the north end of Sandwip Island.

For some years the Meghna River has shown a tendency to shift its channel gradually westward.

NAVIGATION.—Vessels with drafts of 10 feet can proceed up the river as far as Narayanganj. Between February and November navigation is dangerous at time of spring tides when heavy tidal bores form in the lower part of the river. Although river steamers and native boats navigate the river anytime of the year, the most favorable time is between November and February.

In 1964 Hatia Channel, the navigable entrance of the Meghna River, had its entrance about 9 miles southeastward of the south extremity of Sandwip Island. The channel from

its entrance was aligned in a west-northwestward direction, continued north-northwestward along the southwest side of Sandwip Island, thence turned westward leading to a position about 1 mile northward of the north end of South Hatia Island.

Depths in Hatia Channel and over the adjoining shoals are subject to rapid changes; extreme caution is necessary in this area.

Directions cannot be given because of the continuous changes which take place; navigation on the Meghna River should not be attempted without local knowledge. Pilots are considered necessary and may be obtained at Chittagong.

NAVIGATIONAL AIDS.—Four lights are shown from positions along the west side of Sandwip Island. Another light is shown from the north end of South Hatia Island.

A lighted pillar buoy, red and white striped and equipped with a radar reflector, is moored at the entrance of Hatia Channel about 9 miles southeastward of the south extremity of Sandwip Island. A black conical light buoy, equipped with a radar reflector, is moored about 6 1/4 miles south-southeastward of the same point.

Hatia Channel is buoyed; buoys are moved to meet changes in the channel.

TIDAL BORE.—The bore in the outer channels of the Meghna River is very strong for four days at spring tides and its influence is felt to a little beyond Ilsa River, or about 50 miles below Narayanganj. Advancing with violence as a high-crested wave, the Sandwip Channel bore meets another bore rushing up between Hatia Islands and Sandwip Island and forms a dangerous whirl off the northwest end of North Hatia Island. Between November and February the bore is less high and is not considered dangerous.

At the time of the equinoxes, especially with a southerly wind, the bore attains its greatest development when it advances as a wall topped with foam estimated to be nearly 20 feet, at a velocity of 15 knots. In a few minutes the wave has passed and the tidal current has changed from ebb to flood.

The bore was observed from an anchorage at Hatia Bar, three days after the new moon, extending completely across Shahbazpur River with a height of 3 to 4 feet on the shoal flats, but somewhat less in height in greater depths and breaking occasionally. Its estimated velocity was from 5 to 6 knots and it is probable that it is relatively slight in the Shahbazpur.

STORM WAVE.—The storm wave, which occasionally sweeps up the Meghna River in the wake of cyclones, is even more dangerous than the bore. Storm waves are most likely to occur at the break of the monsoons in May and October.

Sandwip Island and the islands of the Hatia group are particularly subject to inundation by storm waves.

The most disastrous storm wave on record occurred on the night of October 31, 1876 with an estimated loss of life of 100,000 persons. Two or three waves in succession flooded Sandwip Island, the Hatia group, and a portion of the mainland.

ANCHORAGES.—Vessels with local knowledge may obtain anchorage off the west side of Sandwip Island, abreast of the village of Sandwip located about 1 1/2 miles inland midway along the west side of the island.

Anchorage may be obtained in Sanwip Channel eastward of Sandwip Island.

STORM SIGNALS.—Storm signals are shown at Chandpur and Narayanganj. See section 4B-5.

CHANDPUR APPROACH

4B-27 Two water towers, adjacent to the railway yards, stand out clearly to craft approaching Chandpur from the north. A breakwater is located on the north point of the entrance to Chandpur Khal (Creek). Choppy conditions and a moderate swell exist in the Meghna at the entrance of the Khal, a fact to be considered when anchoring in the vicinity. The average width of the Khal is from 350 to 400 feet. The north side of the Khal adjacent to the Chandpur installations has depths of 10 to 11 feet at low water in the dry season. The south side generaly has depths of only 2 to 3 feet.

CHANDPUR (23°09′N., 90°33′E.)

4B-28 CHANDPUR, with a population of 40,400, is situated at the junction of the Meghna River and Chandpur Khal (Creek). Several finger piers with depths of 10 to 11

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feet at their heads are available. Supplies of coal, fresh water, and provisions can be obtained.

NARAYANGANJ (23°37'N., 90°32'E.)

4B-29 NARAYANGANJ, a river port and transshipment point, is located about 8 miles southeastward of Dacca. The city with a population of 56,000 is situated on the left bank of the Lakhya River near its junction with the Meghna River. Narayanganj is connected with the main railway system of India. There is inland steamer communication with Calcutta.

PART C. THE CHITTAGONG COAST TO ELEPHANT POINT

COAST—GENERAL

4C-1 THE COAST OF THE CHITTAGONG DISTRICT extends southward from the Feni (Fenny) River for about 150 miles to the Naf River, the boundary between East Pakistan and Burma, a position about 5 miles northeastward of St. Martins Island. Feni River empties into Sandwip Channel about 8 miles northward of the north extremity of Sandwip Island. Between the entrance of the Karnaphuli River and Cox's Bazar the coast is broken by Kutubdia and Maiskhal Islands. Southward of Cox's Bazar to Elephant Point low hills rise close inland and cliffs mark the coastline. Chains of mountain ranges rise parallel with the Chittagong Coast at varying distances inland.

DEPTHS—DANGERS

4C-2 Off the Chittagong Coast the depths decrease gradually from 20 to 6 fathoms from a position about 22 miles westward of Elephant Point (21°11'N., 92°03'E.), thence leading northward for about 45 miles to a position about 15 miles south-southwestward of the entrance of the Karnaphuli River. The 20-fathom curve is charted about 14 miles west-southwestward and 22 miles westward, its northernmost charted position, respectively, from Elephant Point. The 10-fathom curve lies about 7 miles off the coast westward of Elephant Point. Except for defining the south part of a narrow channel, which has depths of 11 to 17 fathoms and lies between the coast and North Patches, South Patches, and Dolphin Shoal, the 10-fathom curve's northernmost position off the Chittagong Coast is charted in the vicinity of South Patches. From a position about 60 miles southward of the mouth of the Hatia River (sec. 4B-2) and 40 miles westward of Elephant Point, the 6-fathom curve is charted in a north-northeastward direction for about 38 miles, thence about 15 miles northeastward to a position about 15 miles south-southwestward of the entrance of the Karnaphuli River, thence southward enclosing the shoals and lesser depths along the Chittagong Coast to Elephant Point. Except for South Patches and a 5 3/4-fathom patch, depths of over 6 fathoms are charted between the 6-fathom curves, the curve on the west and the other on the east along the Chittagong Coast. Inside the 6-fathom curve southward of the entrance of the Karnaphuli River the depths are regular, 4 1/4 to 5 1/2 fathoms. From a position about 6 miles westward of the entrance of the Karnaphuli River and leading northward, thence north-northwestward in the middle of Sandwip Channel there are charted depths of 4 to 4 1/2 fathoms.

DOLPHIN SHOAL with a least depth of 3 fathoms, lies about 3 1/4 to 5 miles west-southwestward of Kutubdia Lighthouse (21° 52'N., 91°51'E.). A shoal with a least depth of 4 1/2 fathoms lies about 7 miles west-southwestward of the lighthouse.

NORTH PATCHES consist of a number of shoals, hard sand, with charted depths of 1 3/4 to 3 3/4 fathoms, which lie in a chain for about 16 miles southward of a position about 6 miles southwestward of Kutubdia Lighthouse. The least depth obtained over these shoals was 10 feet; there is reason to believe that less water than charted may exist. Charted depths of 4 to 6 fathoms lie between and adjacent to the patches.

Southward of the south end of North Patches, shoal depths of 5 1/4 fathoms lie about 13 miles west-by-northward and about 13 1/2 miles west-northwestward, respectively, of the triangulation point (21°26'N., 91°59'E., approx.) at Cox's Bazar. A depth of 5 3/4 fathoms lies between the 5 1/4-fathom depths.

SOUTH PATCHES (21°26'N., 91°40'E.), a shoal area with a least depth of 5 fathoms, lies about 18 miles westward of the triangu-

lation point at Cox's Bazar. There are depths of 7 to 11 fathoms around South Patches.

REJU (Regu) SHOAL, composed of hard sand and rock, has a least depth of 2 3/4 fathoms and lies about 7 miles north-northwestward of Elephant Point. Depths of 6 fathoms and less are charted up to 8 1/2 miles off the coast between Cox's Bazar and Elephant Point.

OFF-LYING DEPTHS

4C-3 A 5 3/4 fathom patch is charted outside the 6-fathom curve about 32 1/2 miles westward of the triangulation point at Cox's Bazar. A depth of 8 fathoms lies outside the 10-fathom curve about 20 1/2 miles west-southwestward of the above triangulation point.

KOHINUR SHOAL lying outside the 20-fathom curve with a depth of 12 fathoms, sand, was reported to exist about 23 1/2 miles westward of Elephant Point.

NAVIGATION

4C-4 The greatest care is necessary in making the entrance of the Karnaphuli River. Whatever the state of the weather or the time of the year, but especially during the Southwest Monsoon from April to September, mariners should exercise extreme caution, being cognizant of and having regard for the depths and dangers.

Even with favorable weather and when a vessel's position is known, strict attention to the depth as well as to the course and distance made good over the ground is necessary.

If the position is doubtful and there is a strong flood or northgoing current, it is well to anchor to avoid being set on the shoals lying off Sandwip Island and the entrance of the Meghna River. These shoals may lie farther southward than indicated on the chart.

Approching from the southwestward and uncertain of a vessel's position, a landfall can be made in the vicinity of the conspicuous white cliffs about 4 miles south-southeastward of Cox's Bazar (sec. 4C-31).

Vessels should pass outside of South Patches, North Patches, and Dolphin Shoal. Soundings should be taken frequently and allowances made for tidal currents.

NAVIGATIONAL AIDS.—A LIGHT is shown from the west side of Kutubdia Island (21° 52'N., 91°51'E.), nearly 2 miles southward from the island's northwest extremity. See section 4C-28.

NORTH PATCHES LIGHTED BUOY, equipped with a radar reflector, is moored off the west side of North Patches about 14 1/2 miles south-southwestward of Kutubdia Lighthouse.

SOUTH PATCHES LIGHT FLOAT, equipped with a radar reflector, is moored in approximately 21°24'N., 91°38 1/2'E., nearly 2 1/2 miles southwestward of the southernmost patch. The light float was reported (1963) to be a good radar target.

During the Northeast Monsoon, from October to March, small fog banks or thick mists occur on the Chittagong Coast on an average of 2 1/2 days a month. These weather conditions cause the lights in some instances to assume a deep red color and in other instances to completely obscure them.

TIDAL CURRENTS

4C-5 The tidal currents in this part of the Bay of Bengal set northward and southward with the trend of the coast; the velocity at spring tides is from 4 to 6 knots. In hazy weather, vessels have been swept past the entrance of the Karnaphuli River by the flood or northgoing current, and set upon the sands southward and southwestward of Sandwip Island, without sighting Kutubdia Island Light by night or the land by day.

WINDS—WEATHER

4C-6 See sections 4-3 and 4C-19.

COASTAL FEATURES—LANDMARKS

4C-7 SITAKUND MOUNTAIN (22°38'N., 91° 41'E.), about 4 1/2 miles inland from the coast on the east side of Sandwip Channel, rises to an elevation of 1,155 feet about 20 miles north-northwestward of Chittagong. A ridge of hills extends south-southeastward from Sitakund Mountain, roughly parallel with the coast for about 18 miles. NAGARKHANA, a hill 289 feet high, is located about 17 miles south-southeastward of Sita-

kund Mountain. About a mile farther southward, at the south end of the ridge and just northward of Chittagong, is FAKIR HILL, 239 feet high. A black pillar, 20 feet high and known as Goods Pillar, stands atop Fakir Hill.

From a position along the coast eastward of the north part of Sandwip Island, a white sandy beach fringes the shore for about 27 miles south-southeastward to the mouth of the Karnaphuli River.

APPROACH TO THE ENTRANCE OF THE KARNAPHULI RIVER

4C-8 THE ENTRANCE OF THE KARNAPHULI RIVER lies between Patenga Point (22°14'N., 91°48'E.) and Norman's Point, about 2 miles south-southeastward of Patenga Point.

NAVIGATION

4C-9 From a position in 22°00'N., 91°49'E. about 12 miles southward of the entrance of the Karnaphuli River, a recommended track for deep-draft vessels is laid down on H.O. Chart 3702 leading northward, thence north-northwestward and passing 1 1/2 to 2 miles offshore in depths of not less than 5 fathoms, chart datum Indian Springs Low Water.

CAUTION.—Small fishing craft without lights and fish nets, marked by small black and white stakes, were reported (January 1965) to be a hazard to vessels approaching the entrance of the river.

TIDES—TIDAL CURRENTS

4C-10 Tides in the approach to and in the Karnaphuli River are semidiurnal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Kutubdia Island: MHWS 12.1 feet, MLWS 1.3 feet; MHWN 8.8 feet, MLWN 4.6 feet.

Norman's Point: MHWS 15.0 feet, MLWS 2.6 feet; MHWN 11.5 feet, MLWN 6.1 feet.
*H.O. Chart 6170, Pakistan Chart 10.

Tidal levels vary with the season, being about 1 foot lower in February and March and about 1 foot higher in July and August.

TIDAL CURRENTS.—See section 4C-5.

About 1/2 mile westward of the outer bar at the entrance of the Karnaphuli River the flood current sets north-northwestward and the ebb current sets south-southeastward. The tidal current turns about 1 1/2 hours after high and low water near Juldia (sec. 4C-22) and 1 1/4 hours after high and low water at Chittagong. During the rainy season, April to September, the velocity of the ebb current is great. Under ordinary conditions the velocity of the tidal current is about 2 knots at neaps and 3 to 4 knots at springs.

DEPTHS—DANGERS

4C-11 See section 4C-2.

On the west side of the approach to the entrance of the Karnaphuli River from south-southwestward, depths of less than 5 fathoms lie southeastward and southward of Meghna Flats (sec. 4B-24) and Sandwip Island (sec. 4B-25), respectively.

Dangers on the east side of the approach are South Patches, North Patches, Dolphin Shoal, and the 4 1/2 fathom shoal, all of which are discussed in section 4C-2.

A foul area, about 100 yards in diameter, lies off the entrance of the river a little more than 2 miles southwestward of Patenga Light Beacon.

A dangerous WRECK lies in 4 1/2 fathoms of water about 8 1/2 miles south-southwestward of Patenga Light Beacon (22°14'N., 91°48'E.).

ASPECT—LANDMARKS

4C-12 PATENGA POINT, on the north side of the entrance of the Karnaphuli River and about 7 1/2 miles southward of Fakir Hill (sec. 4C-7), is low and flat with a few trees. A grassy plain extends some miles inland from the point; in places there is cultivation. A sand and mud flat, which dries at low water, fronts the point for nearly 1/2 mile to the southwestward. Patenga Light Beacon, a black and white steel framework structure, stands on Patenga Point.

NORMAN'S POINT, a low extremity of the coast, lies on the south side of the entrance of the Karnaphuli. Norman's Point Lighthouse, a white brick tower with a black band, stands on the shore about 1 1/4 miles south-

ward of the point. Between Norman's Point and the river's entrance are extensive mud flats of which the outer part dries at low water. Middle Island lies in the center of these flats between 3/4 mile and 1 1/2 miles north-northeastward of the point; the inner end of the island is covered with low trees and bushes. The greater part of Middle Island is awash at high water spring tides during the Southwest Monsoon. The coast between Norman's Point and the lighthouse 1 1/4 miles southward is boardered by sandhills, 10 to 18 feet high.

FOUR TREE HILL, 127 feet high with trees on top, rises about 2 1/4 miles east-northeastward of Norman's Point. From a distance the hill appears to form the south end of a tableland of which JULDIA HILL, about 1 1/2 miles north-northwestward of Four Tree Hill, is a part. RADIO TOWERS, and a FLAGSTAFF with an elevation of 180 feet, stand on Juldia Hill.

COOMBS PILLAR, a white mark 30 feet high, stands at an elevation of 125 feet on the highest part of the ridge about 3/4 mile northward of Juldia Hill.

NAVIGATIONAL AIDS

4C-13 NORMAN'S POINT LIGHT is shown from a position on the shore about 1 1/4 miles southward of the point. A LIGHT is shown from Patenga Point; the light was reported (1965) to be in operation only when vessels are observed approaching or leaving the anchorages. Another report (1965) stated the light was shown from sunset to 2200 local time.

An AERO LIGHT at the Chittagong Airport is occasionally shown from a tower about 2 1/4 miles north-northeastward of Patenga Point.

BEACONS.—A black and white beacon stands on the shore on the south side of the entrance of the Sangu River, about 7 1/4 miles south-southeastward of Norman's Point Lighthouse. A similar beacon stands on the shore 3 1/4 miles south-southeastward of the lighthouse.

Beacons, black and white with diamond-shaped topmarks, stand on the shore about 1/2 mile northwestward and 1 1/4 miles west-northwestward, respectively, of Patenga Light Beacon. Two similar beacons are charted about 2 1/4 miles north-northwestward of the light beacon.

BUOYS.—A light buoy, conical and black and white checkered, is moored a little more than 1 mile south-southwestward of Patenga Light Beacon. A red and white checkered lighted can buoy is moored about 3/4 mile southwestward of the light beacon.

These buoys may be moved to conform with changes in the channel entrance.

RADIOBEACON.—An aeronautical radiobeacon at the Chittagong Airport transmits from a position about 2 1/2 miles northeastward of Patenga Light Beacon. The radiobeacon was reported (1965) to be an excellent radio aid for approaching vessels during periods of poor visibility.

ANCHORAGES

4C-14 Three lettered anchorage areas, A, B, and C, lie off the entrance of the Karnaphuli River. The two areas, A and C, lying northward of the entrance rangeline have least charted depths of 5 1/4 fathoms (ISLW); B area southward of the entrance has a least depth of 4 1/2 fathoms (ISLW). The limits of the areas can best be seen on the chart.

Northward of Patenga Light Beacon bearing about 055° the holding ground is soft mud; vessels are liable to drag their anchors. The mud is firmer southward of this bearing, but attention must be given to the extra strength of the ebb tide which is experienced here, especially during the Southwest Monsoon months. A vessel using this anchorage for more than a few tides should note the way the vessel swings at the change of the tidal current as she is liable to swing in one direction only. Vessel's anchor should be sighted at regular intervals to avoid fouling.

A prohibited anchorage area about 1 1/2 miles wide lies between a line extending from the shore on either side of the entrance of the Karnaphuli River in a southwestward direction for about 2 miles, thence narrowing to a width of about 3/4 mile for an additional 1 1/2 miles.

In 1964 a vessel anchored in about 5 3/4 fathoms with Norman's Point Lighthouse bearing 109° distant about 2 miles. The holding ground was reported good in this position;

maximum current during 11 days at this anchorage was estimated to be 5 knots.

A 1964 report states that the holding ground was good during spring tides while a vessel was anchored in a position with Patenga Light Beacon bearing 070° and Norman's Point Lighthouse bearing 120°.

PILOTAGE—PILOTS—INSTRUCTIONS

4C-15 Pilotage is compulsory for merchant vessels. The entrance of the river is constantly changing and the bar cannot be crossed or the river navigated without local knowledge. Entrance should not be attempted without a pilot. The piloting, maneuvering, and securing is considered one operation and is accomplished by the same person. Pilots are reported to be extremely skillful. Vessels requiring a pilot should advise the Harbor Master at Chittagong 24 hours in advance of their estimated time of arrival at the pilot grounds, about 2 miles off the outer bar; vessel's length and fresh water draft should also be reported.

A seagoing pilot boat, equipped with radio telephone, is stationed at Juldia and conveys pilots to and from vessels. Vessels should approach to 1 mile southwestward of the outer bar light buoy where the pilot boat, displaying the International Code Flag H, will meet them. In moderate to heavy weather a lee must be made for the pilot boat, abcut 1 1/2 miles seaward of the outer bar light buoy. At times a cutter will be used requiring the use of a boat rope. The pilot boat is painted light green and has PILOT in white letters on black boards on each side of the wheelhouse.

Vessels should arrive at the pilot grounds 3 to 5 hours before time of daylight high water.

Vessels with speeds under 7 knots will not be handled during spring tides. The movements of vessels are dependent on draft, length, and berth.

NIGHT PILOTAGE.—Night pilotage facilities are available for departing vessels. Lighted channel buoys exist.

INSTRUCTIONS.—The Harbor Master has issued the following instructions which are effective during heavy weather.

Upon the approach of the pilot boat, a vessel must get underway and make a lee for the pilot boat.

Proper boarding facilities and illumination must be provided for the pilot.

Vessels should not anchor in the close approaches to the fairway.

Vessels with drafts exceeding 22 feet, and expecting a pilot during darkness, shall show two green lights in a conspicuous position; vessels with drafts of 22 feet or less shall show one green light. As possible, pilots will board in the late afternoon for inward pilotage on the following morning tide. This is to avoid the hazards of embarking during darkness in heavy weather.

All vessels must be ready in all respects to get underway when pilots board at a given time. If lighters or flats alongside are removed by the port tug, vessels' agents will be appropriately billed.

Shipmasters are requested to report on the visibility of visual navigational aids and the transmission of the radio beacon during the period of heavy weather.

SIGNAL STATION—STORM SIGNALS

4C-16 A signal station, with a flagstaff at an elevation of 180 feet, stands on Juldia Hill. Blinker and radio-telephone facilities are available. The signal station transmits advance information for pilotage and berthing operations.

STORM SIGNALS.—Storm and weather signals in accordance with the Indian General System (sec. 1-34) are displayed at the port signal station on Juldia Hill and from the flagstaff at Kumar Khal, close southward of Jetty No. 13.

For inland vessels and small craft, weather signals will be displayed from the Port Commissioner's Office.

KARNAPHULI RIVER—PORT OF CHITTAGONG (22°19'N., 91°49'E.)

4C-17 THE KARNAPHULI RIVER is the most important river in the Chittagong District. Small craft navigate the river throughout the year for a distance of about 100 miles above its mouth. CHITTAGONG is located on the west bank of the river about 10 miles above its entrance.

HARBOR LIMITS.—The outer harbor limit, which encloses the outer anchorages off the

entrance of the river, can best be seen on the chart. The limits of the port within the river's entrance are also charted.

NAVIGATION

4C-18 Inbound vessels normally enter on the flood tide; the deeper the vessel, the nearer she enters to the time of daylight high water.

Vessels entering port are required to display their call letters in order to facilitate berthing. Failure to do so will result in a fine and a berthing delay.

Outbound vessels of light draft may leave with the first of the flood tide. Deep-draft vessels depart 2 hours before daylight high water.

Night navigation is practiced in a restricted manner. Though the river can be negotiated only on the flood tide, night aids permit additional sailings on several days of each of the months of October through March.

The river may be closed to navigation during periods of freshets when there isn't any flood tide.

The maximum length of a dry-cargo vessel that can be accommodated in the river is limited to 535 feet by the berths and moorings. Tankers are limited to a maximum length of 547 feet. A vessel with a length of 570 feet, using an anchor has turned in the channel below the jetties with room to spare. The channel varies in width from 225 to 365 yards.

WINDS—WEATHER

4C-19 Chittagong is in the track of cyclones; great damage has resulted from them on numerous occasions. See section 4-3.

A hot, sultry day followed by still air conditions in the evening usually results in thunder storms. The peculiarity of these storms (Nor'westers) is that they approach from the north and west in the form of a line squall accompanied by intense lightning, thunder, rain and/or cyclonic rotation winds which may reach a velocity of upwards of 50 knots. When signs of such a Nor'wester storm exist, shipmasters must exercise great caution. Vessels at fixed moorings and pontoon jetties must exercise extreme caution when a Nor'wester storm is blowing.

In general, rainfall is heavy during the Southwest Monsoon; dense fogs occasionally occur. Early morning fogs, clearing by mid-morning, also occur during December through February and sometimes in March. The fine weather period is from the middle of October to March.

See Appendix for Chittagong Meteorlogical Table.

TIDES—TIDAL SIGNALS—TIDAL CURRENTS

4C-20 Tides at Chittagong are semidiurnal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—MHWS 13.0 feet, MLWS 1.5 feet; MHWN 10.0 feet, MLWN 3.2 feet. *H.O. Chart 3702, B.A. Chart 84.

TIDAL RANGES for the Karnaphuli given by the Chittagong Port Trust are as folows:

Spring range, SW Monsoon----up to 20 feet.
Neap range, SW Monsoon-----up to 9 feet.
Spring range, Winter---------- 9 to 13 feet.
Neap range, Winter ---------- 5 to 8 feet.

TIDE GAUGES.—A tide gauge, marked in 3-inch divisions, stands on the edge of a mudbank along the east bank of the river, about 1/2 mile north-northwestward of the tidal semaphore on Juldia Hill. Tide gauges are also located on the west side of the river in the vicinity of Kumar Khal and at Sadarghat, about 2 1/4 miles above Kumar Khal.

TIDAL SIGNALS.—A tidal semaphore on Juldia Hill indicates by day the height of water above tidal datum. The semaphore has three arms, the upper which indicates fathoms, the oenter feet, and the lower inches. The angle which each arm makes with the vertical as seen from seaward, measuring downward from the top, has the following meaning:

Upper Arm:
- 45° to the right indicates 1 fathom.
- 90° to the right indicates 2 fathoms.
- 135° to the right indicates 3 fathoms.
- 45° to the left indicates 4 fathoms.

Middle Arm:
- 45° to the right indicates 1 foot.
- 90° to the right indicates 2 feet.
- 135° to the right indicates 3 feet.
- 45° to the left indicates 4 feet.
- 90° to the left indicates 5 feet.

Lower Arm:
45° to the right indicates 3 inches.
90° to the right indicates 6 inches.
135° to the right indicates 9 inches.

A black ball is hoisted on top of the semaphore at high water and dropped when the tide has fallen 3 inches below high-water level.

The semaphore is also visible from the Chittagong jetties.

TIDAL CURRENTS.—The tidal currents set across the outer part of the bar; the flood sets to the north-northwestward and the ebb to the south-southeastward.

During the Southwest Monsoon season, in the months June to September and sometimes October, strong freshets are experienced at which time there may be no flood current for several days. The velocity of the current is about 6 to 8 knots during freshets; notices regarding them are circulated well in advance.

Current Velocities

Spring tides, SW Monsoon	4 1/2 to 5 1/2 knots.
Neap tides, SW Monsoon	2 1/2 to 3 1/2 knots.
Spring tides, Winter	up to 3 knots.
Neap tides, Winter	up to 2 knots.

DEPTHS—DANGERS—DRAFTS

4C-21 Mean low water ordinary spring depths of 12 feet over the outer and inner bars and 13 feet over Gupta Bar are maintained throughout the year.

The depths over the bars and in the river are constantly changing and the beacons and buoys are moved accordingly. The decreased depths over the bars during August and September are offset by the greater height of the spring tides during that interval. The least depth in the middle of the fairway for a distance of about 3 miles below Chittagong was 14 feet in May of 1963.

A confused and dangerous sea breaks on the outer bar during strong southwesterly winds.

A detached 17-foot patch, about 1 1/2 miles south-southwestward of Patenga Light Beacon, lies nearly 400 yards southeastward of the south extremity of the outer bar shoal.

A depth of 6 feet lies near the edge of the shoal bank along the east side of the entrance of the river, about 3/4 mile south-southwestward of Patenga Light Beacon.

The river channel narrows and shoals above Sadarghat, which is on the same side of the river as Chittagong and about 3/4 mile below the upper port limit.

A dredger is employed on the bars to maintain, as far as possible, constant depths throughout the year. When the dredger is at work on the outer bar, all inbound vessels shall display a black ball at the foremasthead 15 minutes before approaching the outer bar. Vessels closing the outer bar in order to ascertain the tidal rise, as shown by the Juldia Hill semaphore, need not display this signal.

Anticipated safe drafts are published and circulated 3 to 4 months in advance. For January, February, and March of 1965, maximum safe drafts (fresh-water) for inbound vessels were 22 1/4, 22 1/2, and 23 feet, respectively.

Approximate Safe Drafts During a Year

January-March	:	Springs-23′03″-24′00″
		Neaps -18′06″-19′06″
April-June	:	Springs-24′08″-27′00″
		Neaps -21′00″-23′00″
July-September	:	Springs-27′08″-27′00″
		Neaps -23′00″-24′00″
October-December	:	Springs-26′01″-23′06″
		Neaps -22′00″-20′00″

To determine the draft for entering or leaving port, the depth of 12 feet over the bars is added to the height of water in the tide tables allowing for an error of 12 to 14 inches, depending on the phase of the moon and season.

A deep-draft vessel, intending to discharge cargo, may gain a 3 to 6 inch draft advantage by entering close to time of high water and berth, whenever practicable, on the ebb current.

A 1965 report states the water salinity at the outer anchorages changes from almost salt water to practically fresh water, depending on the tide. This causes corresponding differences in vessels' drafts and is important in that maximum drafts are based on fresh water. Pilots check drafts of deeply loaded vessels. It was further reported that

due to siltation the channel for crossing the bar is a sharp zigzag and the usual extra draft allowances, such as 3 inches for vessels of less than 500 feet in length and a speed of over 14 knots, are not granted.

WRECKS.—A wreck is charted along the east side of the channel at the north end of Juldia Training Wall, about 1/2 mile west-northwestward of the signal station on Juldia Hill.

A wreck, marked by a green and white conical light buoy, is charted near the training wall on the east side of the channel at Gupta Bar, nearly 2 miles northward of the signal station on Juldia Hill.

ASPECT

4C-22 The entrance of the river lies between a training wall on the west side, which retains a sand and mudflat extending about 1/2 mile southwestward from Patenga Point, and a stone apron on the east side which is the southwest extension of Juldia Training Wall. Mudflats and Middle Island lie southeastward of the stone apron and Juldia Training Wall. The stone apron and training walls at the entrance of the river have been reported to be submerged at high water.

The outer bar fronts the entrance of the river about 1 1/2 miles southwestward of Patenga Light Beacon. The inner bar lies about 2 1/2 miles within the entrance and westward of Juldia Hill. Gupta Bar is about 5 miles above the river's entrance.

About 1 mile north-northwestward of Norman's Point, the east bank of the river curves northeastward for a distance of 2 1/2 miles to a position northwestward of Juldia Hill. Large mudflats lie along this part of the bank and embankments have been constructed to prevent inundation. Several small villages are situated on this section of the bank. About 2 1/4 miles farther northward, the east bank becomes low and swampy and is cultivated. Mud Islands or chars, the largest of which are Gupta and Lukia Islands, are part of this bank and low-lying land to the eastward. Back Channel Khal and a passage for boats at half tide separate Gupta Island and Lukia Island, respectively, from the mainland to the eastward.

The west bank of the Karnaphuli trends northeastward from Patenga Point for about 3 miles to Gupta Point. Active Spit, the greater part of which is enclosed by a training wall, lies between the west bank and the training wall, eastward through southward of Gupta Point. Numerous khals (creeks) intersect the west bank of the river for a distance of about 4 miles between Gupta Point and the jetties at Chittagong.

NAVIGATIONAL AIDS

4C-23 Lighted and unlighted pairs of range beacons mark the channel for about 5 miles within the entrance of the river to a position above Gupta Crossing.

Light buoys mark the channel in places along the above described section of the channel; black and white checkered conical light buoys are moored along the east side and red and white checkered can light buoys are moored along the west side of the channel, respectively.

Range beacons and buoys are moved as necessary to meet changes in depths in the channel.

ANCHORAGES

4C-24 Vessels can anchor temporarily in certain reaches of the river on their way to or from Chittagong. However, there is only swinging room at or near high water, and then only with the assistance of the engines. Vessels cannot remain at anchor at low water.

QUARANTINE ANCHORAGE.—Vessels with plague or other infectious diseases on board must anchor off Coombs Pillar until inspected by the Health Officer.

MOORINGS

4C-25 There are a number of fixed moorings, the positions of which can best be seen on the chart. Vessels can be moored on the flood or ebb current as desired, subject to the approval of the Deputy Conservator (Harbor Master).

A number of swinging moorings for small vessels are laid off and below Sadarghat Jetty. These are mostly used by Port Trust and Government vessels.

Extra lengths of line should be kept at hand

when mooring to buoys. Buoys are tri-chained and normally will not shift. Adequate mooring during freshets must be maintained.

FACILITIES

4C-26 CHITTAGONG is being developed as the leading port of East Pakistan. The administration of the port is controlled by the Minister of Communications, Government of Pakistan, with management vested in a Board of Trustees (Chittagong Port Trust). In 1963 Chittagong had a population of 360,000. Jute, jute products, fertilizer, hides and skins, tea, and timber are the principal exports. The port handled 3,220,000 tons of cargo in 1962-1963.

BERTHING.—A vessel entering on the flood tide normally turns off the berth using the starboard anchor; after turning, the starboard anchor is weighed and vessel proceeds to jetty or mooring berth using the port anchor.

BERTHS.—The port at full operating capacity can accommodate twenty-three vessels. Three jetties for ocean vessels were rendered completely out of commission by the cyclones of recent years, thus increasing the already serious problem of port congestion. In early 1965 eighteen merchant vessels were reported in the inner harbor at one time. A June 1965 report stated that the jetty area was considerably torn down by demolition work in preparation for anticipated new construction and that all work on the jetties was suspended.

The port has seventeen jetties of which thirteen railway jetties, numbered 1 to 13, provide a continuous 7,000-foot long wharf with berthing lengths ranging from 445 to 535 feet. Jetties nos. 4, 5, and 6 were inoperative (1965). Depths alongside the railway jetties range from 18 to 30 feet. Two pontoon jetties will accommodate vessels up to 525 feet; there are two light jetties, one of which will accommodate a vessel up to 490 feet in length (inoperative 1965). The pontoon and light jetties have depths alongside of 30 to 35 feet.

Four oil moorings have lengths of 340, 565, 635, and 650 feet. The two oil berths with the greatest berthing lengths have pontoons for pipe lines. Three mooring buoy berths will accommodate vessels with lengths of 400 to 525 feet. Depths at the mooring buoy berths are 30 to 35 feet.

There is a naval jetty, with a 650-foot face, at the East Pakistan Naval Base. Numerous wood jetties accommodate lighters.

TUGS.—The port has two sea-going tugs; one of 1,000 hp. and the other of 1,200 hp. One of these tugs is available for salvage towing. There are several small tugs and a number of mooring launches.

A mid-1965 report stated that efficient tug service was not available.

CARGO INFORMATION.—Vessels with lengths greater than permitted entry of the river are unloaded at the outer anchorage. Deeply loaded vessels are lightened or unloaded at the outer anchorage. Cargo is lightered between vessels at the outer anchorage and shore facilities in the port; cargo to and from vessels moored in the river is similarly handled.

Explosives are handled at the outer anchorage; safety explosives can be discharged at Berth No. 16.

Cargo handling equipment includes wooden lighters of 20 to 50 tons capacity and steel lighters of 50 to 500 tons capacity available in sufficient numbers. There are four 1-ton cranes, one 3-ton mobile crane, nineteen 3-ton electric portal jib cranes, and nine 6-ton mobile cranes. Heavy lift yard cranage comprises five 5-ton cranes, one 6-ton steam gantry crane, and one 25-ton electric gantry crane. A floating crane of 50 tons capacity is available, but three weeks notice should be given as it serves a large area.

Thirteen transit sheds adjacent to the continuous wharf provide covered storage space. Three paved areas are used as open dumps for general cargo; there is an open dump for coal.

PROVISIONS.—Procurement of local fresh provisions is inadvisable. Dry provisions in limited quantities are obtainable, but are reported to be of inferior quality and expensive.

DECK AND ENGINE SUPPLIES.—Some deck supplies may be obtained; engine supplies are obtainable.

FUEL OIL.—Fuel oil bunkers may be taken at three fueling berths at the rate of 52 to 120 tons per hour; the rate depends on the size of the pipeline. Fuel oil is also supplied by a 150-ton oil barge at a rate of up to 30 tons per hour. Diesel oil is obtainable only at the fuel berths.

COAL.—Coal bunkers are obtainable.

WATER.—Drinking water is piped to the jetties and a quantity up to 1,000 tons per day may be obtained. Water is also supplied by water boat. Drinking water should be boiled.

REPAIRS.—Minor repairs to boilers and machinery can be made by the Port Trust Marine Workshop. Two small marine railways handle harbor craft; one is suitable for small vessels up to 80 feet in length and the other for barges up to 200 feet in length. A diver is available.

COMMUNICATIONS.—The Pakistan Eastern Railway and the Inland Water Transport connect the port with all of East Pakistan. There is regular sea communication with Indian ports and Colombo. Chittagong Airport, 4 miles south of the city, affords regular air service to Calcutta and Rangoon. Radiotelephone, telephone, and telegraph services are available.

Chittagong has a commercial radio station; the Pakistan Navy also operates a radio station in the port.

MEDICAL.—There are two hospitals, one is the Railway Hospital and the other is the Medical College Hospital. The Chittagong Port Trust expected to complete a 70-bed hospital in 1965.

In April and May epidemics of smallpox and cholera are common; fever is prvalent during September towards the close of the rainy season. Malaria is prevalent.

Deratting and Deratting Exemption Certificates can be issued at Chittagong.

COASTAL FEATURES—LANDMARKS (CONTINUED)

4C-27 THE CHITTAGONG COAST from the entrance of the Karnaphuli River trends about 66 miles southward and south-southeastward to Elephant Point (21°11'N., 92°03'E.). About midway between the above two positions is a group of deltaic islands separated from each other and from the mainland by shallow channels.

DEPTHS AND DANGERS along this section of the coast are discussed in section 4C-2.

FOR NAVIGATIONAL AIDS along this section of the coast, see sections 4C-4 and 4C-13.

Between Norman's Point (sec. 4C-12) and the north point of the entrance of the Sangu River, about 4 1/2 miles south-southeastward of Norman's Point Lighthouse, the coast is low, wooded, and in places there are low sandhills. A drying mud flat extends about 1/4 mile offshore along this stretch of the coast.

The north point of the entrance of the Sangu River is backed by low sandhills; a sand and mudflat, which dries in places, extends southward from the north point for about 2 1/2 miles. The entrance channel of the river lies about 3 miles southward of the north point and has a least charted depth of 1 1/4 fathoms. Large native craft navigate the river throughout the year.

Southward of the entrance of the Sangu River the coast is low and wooded; sandhills up to 25 feet high back the coast. About 7 miles southward of the Sangu entrance the coast recedes at Cuckold Point. A drying mudflat, which covers at low water during the Southwest Monsoon, fronts the coast between the Sangu entrance and Cuckold Point and extends as much as 2 miles offshore.

The coast southward of Cuckold Point for about 11 miles is broken by numerous shallow streams. Kutubdia Island lies about 1 1/4 to 2 1/4 miles westward of this section of the coast; Kutubdia Channel lies between this coast and Kutubdia Island.

4C-28 KUTUBDIA ISLAND (21°51'N., 91°52'E.), about 12 miles long in a north-south direction, is low, flat, and covered with trees. The island, subject to inundation, is protected from encroachment of the sea by a ring of embankments. Kutubdia Island is visible at a distance of about 8 miles. See section 4C-4 for Kutubdia Island Light.

ANCHORAGE.—Anchorage may be obtained in about 7 fathoms with Kutubdia Island Lighthouse bearing 068°, distant about 1 mile.

The anchorage is fairly well protected, but the tidal currents run as strongly there as outside the shoals.

Approach to the anchorage should be made from northward of Dolphin Shoal (sec. 4C-2).

4C-29 A CHANNEL, about 30 miles long in a north-south direction, lies between Kutubdia Island, Maiskhal Island, and Sonadia Island on the east and Dolphin Shoal, North Patches, and South Patches on the west. Depths in the channel range from 5 1/2 to 17 fathoms. Tidal cur-

rents set at a high velocity through the channel, and it should not be attempted without local knowledge.

MAISKHAL ISLAND lies southeastward of Kutubdia Island; MATARBARI ISLAND, low and flat, lies between Kutubdia Island and Maiskhal Island.

KUTUBDIA CHANNEL, the narrow passage between the mainland and Matarbari Island on the east and Kutubdia Island on the west, has charted depths of 2 1/4 to 6 fathoms. Depths in the channel are subject to rapid changes and cannot be relied upon.

MATARBARI CHANNEL lies between Matarbari Island and Maiskhal Island.

MAISKHAL ISLAND is about 14 miles in length and 6 miles in width. A range of low hills, nearly 300 feet high, rises near the center of the island. GARAMCHARI HILL, 283 feet high, is not distinctive as the range is of uniform height. Low hills rise on the east part of the island for the greater portion of the island's length, which lies in a north-south direction. The north, south, and west coasts of Maiskhal Island are low and fringed with mangrove. There are sandhills from 10 to 25 feet high along the south coast. MAISKHAL BLUFF, 200 feet high and conspicuous, is close northward of the village of Adinath Bazar, which is located near the southeast extremity of the island. A marsh and swamp flat fronts the west side of Maiskhal Island up to 3 miles offshore, southward of the Matarbari Channel entrance.

SONADIA ISLAND (21°29'N., 91°53'E.), with its center about 2 miles south-southwestward of the southwest extremity of Maiskhal Island, is a 5-mile long narrow island lying in a northwest-southeast direction. Low white sandhills mark the island. Sonadia Island lies on a bank, which fronts the island at distances up to 2 1/4 miles and in places on the bank patches uncover at low water. The sea breaks heavily over this bank during the flood current. The area between Sonadia and Maiskhal Islands is nearly filled by a sand and mudflat which dries in places at low water.

LATTADIA ISLAND lies about 3 1/4 miles northward of the northwest end of Sonadia Island; the small island, about 400 yards long and narrow in width, lies in about the middle of the marsh and swamp area which fronts the west side of Maiskhal Island.

HAMIDARDIA (Red Crab) ISLAND lies about 1/4 mile southward of the southeast end of Maiskhal Island. The sandy island is narrow and about 1 3/4 miles long. A mangrove swamp between the islands of Hamidardia and Maiskhal covers at high water.

MAISKHAL CHANNEL lies between the east side of Maiskhal Island and the mainland. The depths in Maiskhal Channel are subject to rapid changes and cannot be relied upon.

RUPADIA SANDS, with depths of 1 fathom and less over the inner part of the sands and around the outer part which for the most part is bare, extend up to about 2 1/4 miles southward of the southeast end of Sonadia Island. The sands comprise the southeast part of the bank which fronts Sonadia Island. The sea breaks over the outer edge of the sands and a sand about 1/4 mile southward of the southeast end of Sonadia Island dries about 1 foot. Rupadia Sands lie on the west side of the entrance of Maiskhal Channel which leads between the southeast end of Sonadia Island and the mainland, about 1 1/2 miles eastward of the southeast end of Sonadia Island.

COX'S BAZAR (21°27'N., 91°58'E.)

4C-30 COX'S BAZAR, located on the mainland on the south side of Maiskhal Channel, is situated on a low range of sandhills between the Baghkhali River and the sea. A wide beach fronts the town along its seaward side.

TIDAL HEIGHTS ABOVE *CHART DATUM—COX'S BAZAR.—MHWS 11.2 feet, MLWS 1.2 feet; MHWN 8.2 feet, MLWN 4.2 feet. *H.O. Chart 6170.

DEPTHS—DANGERS.—The 6-fathom curve lies parallel with the southeastward trend of Sonadia Island and the mainland from a position a little less than 1 mile westward of

the northwest end of Sonadia Island to a position about 3 1/2 miles west-southwestward of Cox's Bluff. From the latter position the 6-fathom curve lies in a southward direction and is farther offshore. The bank which fronts Sonadia Island, Rupadia Sands, Outer Spit, Inner Spit, and the other dangers which lie adjacent to the entrance of Maiskhal Channel are within the 6-fathom curve between the above two positions. The distance between the 6-fathom and 3-fathom curves is 1/4 mile and less in places, especially southwestward of Rupadia Sands and Outer Spit.

OUTER SPIT lies close southeastward of the outer edge of Rupadia Sands and about 3 1/2 miles westward of Cox's Bluff. Outer Spit, with a least depth of 3 feet, lies on the west side of the principal entrance of Maiskhal Channel; the sea breaks on the spit at all stages of the tide, except slack water.

INNER SPIT, which dries in patches from 1 foot to 4 feet, lies between positions about 2 1/2 miles westward and 3 1/4 miles west-northwestward, respectively, of Cox's Bluff. Inner Spit lies on the east side of the principal entrance of Maiskhal Channel; the sea breaks heavily on the spit, especially during the flood current.

The depths between Inner Spit and the beach fronting Cox's Bazar are irregular; in several places the depths are less than 1 fathom and in other places there are depths of 1 fathom to 4 and 5 fathoms. A patch, which dries about 1 foot, lies about 2 1/2 miles northwestward of Cox's Bluff. Depths of less than 3 fathoms lie about 2 3/4 miles to 3/4 mile offshore, northward to southward, respectively, for about 4 miles southeastward of Inner Spit to a position about 3 miles south-southeastward of Cox's Bluff.

The bars which front the entrances of Maiskhal Channel and link the dangers adjacent there to had least LWS depths of 8 feet (1960). Due to the rapid changes caused by seasonal erosion and siltation the postions of the bars and the depths in the channels cannot always be relied upon.

ASPECT—LANDMARKS.—The town of Cox's Bazar is probably not prominent from seaward; hills rise abruptly close southward of the town and back the coastal lowland southeastward of Cox's Bazar. COX'S BLUFF rises steeply to a height of 160 feet about 1/2 mile southward of the town. TWIN CASUARINA TREES at a height of 190 feet stand on high ground close southeastward of Cox's Bazar and are reported to be conspicuous to vessels approaching from the southward. A BUDDIST SHRINE surmounts the hills in the vicinity of the town and is reported to be a good landmark. The CIRCUIT HOUSE, a large white building, stands near the shore about 1/2 mile northwestward of Cox's Bluff and should show well from seaward. TUNGABARANGA triangulation point, charted in 21°26'N., 91° 59'E. (approx.), is about 1/4 mile southeastward of Cox's Bluff. Southward of Cox's Bazar the coastal lowlands and the hills backing the lowlands provide no distinctive landmarks for several miles.

CHANNELS.—The principal entrance of Maiskhal Channel lies between Outer Spit and Inner Spit over a bar of sand which probably shifts during the Southwest Monsoon. Another entrance channel leads between Rupadia Sands and Outer Spit.

There are generally heavy rollers off the entrances of these channels; the rollers occasionally break on parts of the bars.

A boat channel lies close to the mainland and inshore of the breakers and leads to the principal channel.

Maiskhal Channel leads to the entrance of the Baghkhali River and to an anchorage off the mouth of that river, about 5 miles within the entrance of Maiskhal Channel, which then leads between Maiskhal Island and the mainland.

Baghkhali River for about 2 miles within its entrance and along the east side of Cox's Bazar had a least LWS depth of 2 feet (1960).

All channels were unmarked in 1960.

ANCHORAGES.—The offshore anchorages are open and exposed to sea and swell, especially during the Southwest Monsoon.

Vessels of moderate draft can anchor in 5 fathoms, sand and mud bottom, with Cox's Bluff bearing 055°, distant 3 1/4 miles.

Vessels of light draft can anchor in about 4 fathoms, sand and mud bottom, with Cox's Bluff bearing 043°, distant 2 3/4 miles.

Vessels which can cross the bar may obtain anchorage off the mouth of the Baghkhali River in Maiskhal Channel in depths of 6 to 9 fathoms, mud.

DIRECTIONS.—Reliable pilots are not available. Due to changing conditions in the entrance, specific directions cannot be given.

Vessels should approach the coast, with Cox's Bluff bearing 060°, at about half-flood tide when the breakers will give a good indication of the edges of the dangers. The bar and the channel should be examined before entering.

COX'S BAZAR.—The town is not a port of call for ocean-going vessels, but has sea communication with Chittagong. A wharf about 365 feet long has a least depth alongside of about 3 feet and is equipped with a 5-ton crane. Small supplies of fresh provisions and water are obtainable. Poor roads lead northward to Chittagong and southward to Akyab, Burma. There is a post and telegraph office.

COASTAL FEATURES—LANDMARKS (CONTINUED)

4C-31 FROM COX'S BAZAR TO ELEPHANT POINT, located about 15 1/2 miles south-southeastward of Cox's Bluff, the coast is backed by low hills.

RED CLIFFS, about 200 feet high, line the coast between about 3 1/2 and 6 1/2 miles south-southeastward of Cox's Bluff. SOUTH CLIFF, the southernmost cliff, is 270 feet high. From seaward these cliffs appear white when the sun is shining on them; in clear weather they may be visible at distances of 20 miles. The cliffs are a good LANDMARK for vessels approaching Chittagong from the southward.

WAILA TAUNG (Sugarloaf Hill) rises to an elevation of 1,356 feet about 11 miles east-northeastward of Elephant Point.

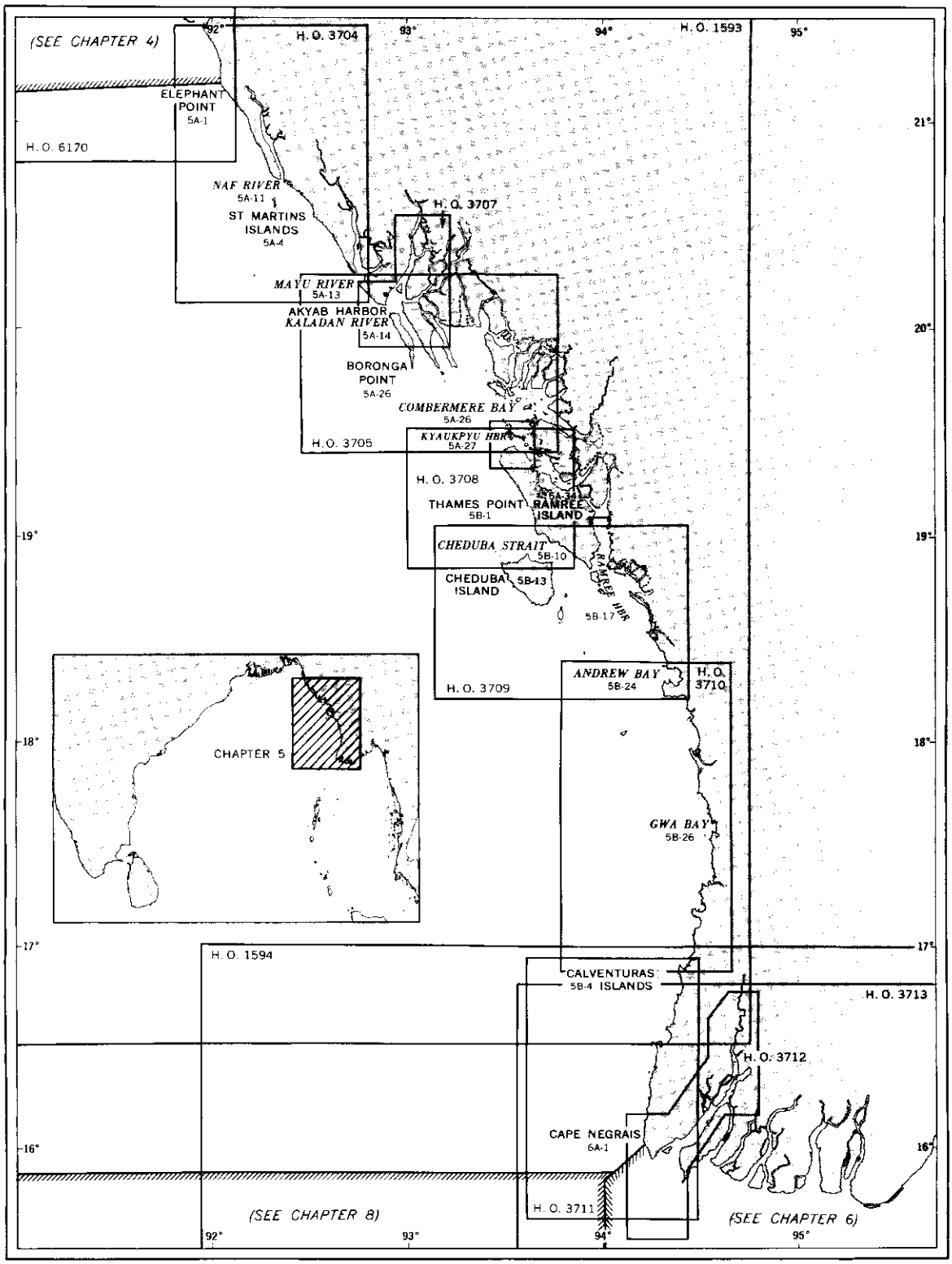

Chart limits shown are of the best scale charts issued to naval vessels by the U.S. Naval Oceanographic Office.
Numbers refer to the section in the text describing a designated locality.

CHAPTER 5—GRAPHIC INDEX

CHAPTER 5

COASTS OF EAST PAKISTAN AND BURMA FROM ELEPHANT POINT TO CAPE NEGRAIS

Part A. Elephant Point to Thames Point
Part B. Thames Point to Cape Negrais

PLAN.—The remaining part of the Chittagong Coast of East Pakistan, including St. Martins Islands, is described in this chapter. Thence follows a description of the Arakan Coast of Burma to Cape Negrais and includes the port of Akyab and Kyaukpyu Harbor. The progression is from north to south.

GENERAL REMARKS

5-1 Cape Negrais is located about 333 miles south-southeastward in a straight line from Elephant Point; the coast in between for the most part is irregular and broken by the many rivers which empty their waters into the east side of the Bay of Bengal. Hills and mountain ranges back the coast at varying distances inland; in general these parallel the coast in a north south direction. Mayu and Arakan Yoma are the principal mountain ranges. Ramree Island and Cheduba Island, the largest islands along this section of the coast, lie about midway between Elephant Point and Cape Negrais. Combermere Bay and Hunters Bay indent the coast northward of Ramree Island. Akyab is the most important port; Kyaukpyu is of some importance.

NAVIGATION

5-2 Navigation offshore of and along the Chittagong and Burma Coasts between Elephant Point and Cape Negrais may be as direct and close to shore as safe navigation will permit. Navigational warnings are broadcast from Chittagong and Rangoon. See H.O. Pub. 117B.

WINDS—WEATHER

5-3 The weather and climate of Burma is primarily influenced and determined by the Northeast and Southwest Monsoons and the short transitional periods between them. The year is divided into four seasons referred to as the Northeast Monsoon (winter monsoon, cool or dry season), the spring transitional or hot season, the Southwest Monsoon (summer monsoon, wet or rainy season), and the autumn transitional season.

The Northeast Monsoon, December through March, is marked by fine weather with very little rainfall.

The hot season, April and May, is an interim period of weak and variable winds prior to the Southwest Monsoon. Increases in rainfall in April and May do not equal the amounts of rainfall during June through August; this results in greater heating of the air masses.

The Southwest Monsoon, June through September, is characterized by cloudiness, overcast skies, light rain almost daily, interspersed with rain squalls or thunderstorms accompanied by torrential downpours. Restricted visibility, high humidity, and general adverse weather conditions are associated with the Southwest Monsoon.

The autumn transitional season, a period of weak and variable winds with land and sea breezes prevailing, occurs in early October after the withdrawal of the Southwest Monsoon and before the cooler, drier weather of the Northeast Monsoon is established in late November.

Tropical storms with destructive winds occasionally affect the coastal regions north of 15°00'N.

Tropical cyclones, which develop in the Bay of Bengal, occur most frequently during the transitional season. The Arakan Coast of Burma is more likely to be struck by a cyclone during the autumn transitional season than at any other time, but rarely is the Gulf of Martaban affected. During the hot season some tropical cyclones cross the coast of the Gulf of Martaban.

CURRENTS—TIDAL CURRENTS

5-4 The monsoon winds affect and influence the surface currents. To a great extent the currents are variable and at the height of each

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monsoon, currents may sometimes be met setting in the opposite direction to the monsoon current, or in general in any direction. The currents are still more variable during the transition periods of the monsoons. The Northeast Monsoon tends to produce a seasonal current setting to the westward and the Southwest Monsoon a similar current setting to the eastward in the open waters of the Bay of Bengal. See section 1-70.

Tidal currents along the Chittagong Coast southward of Elephant Point set parallel with the coast, the flood current setting northward and the ebb current setting southward.

Tidal currents along the Arakan Coast set northward on the flood, southward on the ebb, and are greatly influenced by the immense volume of tidal backwater. Local indrafts of the current are strong during the flood and the outset is small during the ebb.

CAUTION—DANGERS

5-5 Mariners should be cognizant of and have regard for the numerous dangers which lie offshore between Elephant Point and Cape Negrais.

PART A. ELEPHANT POINT TO THAMES POINT

5A-1 ELEPHANT (Dombak) POINT (21° 11'N., 92°03'E.), about 9 1/2 miles southward of South Cliff, is backed by Elephant Point Summit, a conspicuous hill 410 feet high, which is visible in clear weather at a distance of 20 miles. Elephant Point has been reported to give a good radar presentation at a distance of 35 miles.

COAST—GENERAL

5A-2 The Chittagong Coast of East Pakistan, south-southeastward of Elephant Point to the entrance of the Naf River, is marked by hills and a low mountain range which parallels the coast and rises not far inland on the Naf Peninsula. In Burma, the north part of the Mayu range attains elevations up to 2,260 feet eastward of the Naf Peninsula; the south part of this range, which is lower, terminates close inland of the coast on the north side of the entrance of the Mayu River.

The coastal land area between the Mayu and Kaladan Rivers is low and intersected by numerous creeks. Akyab, Burma's principal port along the Arakan Coast, is situated within the mouth of the Kaladan River.

Southeastward of the entrance of the Kaladan River to Ramree Island, low mountain ranges mark the broken coast which is deeply indented by Hunters and Combermere Bays. Kyaukpyu Harbor lies off the north side of the northwest extremity of Ramree Island.

DEPTHS—DANGERS

5A-3 Depths of less than 100 fathoms lie off the coast towards the head of the Bay of Bengal northward of a position about 40 miles southwestward of the entrance of the Kaladan River. From the above position the 100-fathom curve is defined in a southeastward direction and is charted about 30 miles southwestward of Ramree Island and 6 1/2 miles southwestward of Cheduba Island, the latter position being the nearest the 100-fathom curve is to the coast between Elephant Point and Cape Negrais.

The 20-fathom curve is not defined off the coast between Elephant Point and a position about 18 miles west-southwestward of the entrance of the Mayu River. From the above position the 20-fathom curve is charted southeastward to a position about 18 miles west-southwestward of Thames Point, which is located on the west side of Ramree Island. The 20-fathom curve lies to within 10 miles of the west side of the northwest extremity of Ramree Island and about 16 miles west-southwestward of the entrance of the Kaladan River.

The 10-fathom curve lies about 7 miles westward of Elephant Point and 3 miles westward of the west side of the northwest extremity of Ramree Island. Southwestward of the entrance of the Kaladan River the 10-fathom curve is defined in an irregula pattern, lying between 15 and 7 miles off the entrance. Southeastward of the entrance of the Kaladan River the 10-fathom curve is charted near the shore in the proximity of the west side of Myengun Kyun (West Boronga Island) and the island's south extremity, Boronga Point.

Between Boranga Point and Ramree Island,

depths within the outer 20-fathom curve westward of Combermere Bay and in the approach to Kyaukpyu Harbor are irregular. Scattered patches with depths of 6 3/4 to 10 fathoms lie between the outer 20-fathom curve and the 10-fathom curve where the depths elsewhere between the curves range from 11 to 28 fathoms.

Many small islands lie within and around Combermere Bay; the larger islands form the broken coast between the entrance of the Kaladan River and Ramree Island.

Numerous islands, reefs, rocks, and shoals lie off the coast, at distances up to 16 miles offshore, between Elephant Point and Thames Point.

Mud volcanoes occasionally rise from the sea off the coast between the entrance of the Kaladan River and Cheduba Island. Many of these exist only temporarily and disappear, leaving a shoal. Mariners should keep a constant and careful lookout as it is not possible to keep their existence charted.

NOTE.—The islands and dangers off the coast between Elephant Point and Thames Point lying outside the 5 and 6-fathom curves, including St. Martins Islands, are discussed under off-lying dangers in sections 5A-4 through 5A-6. Dangers along the coast within the 5 and 6-fathom curves are discussed in the sequence of the coastal description.

OFF-LYING ISLANDS AND DANGERS

5A-4 ST. MARTINS ISLANDS (20°37'N., 92°20'E.) consists of a large island and two small islets located between 5 1/2 and 9 miles south-southwestward of Shahpuri Point, the extremity on the northwest side of the entrance of the Naf River. The island and islets are connected by drying ledges of sand and rock. At the north end of the large island is North Tall Tree, a casuarina clump about 110 feet high; near the south end of the island is another clump of trees. Sunken rocks and depths of 1 fathom to 4 3/4 fathoms lie up to about 1 mile off the west side of the large island; depths between St. Martins Islands and the coast of the mainland to the northward and eastward are less than 5 fathoms.

ANCHORAGE.—A well-sheltered anchorage may be obtained about 1/2 mile eastward of the north end of the large island in about 4 fathoms, good holding ground. The best water in the approach to the anchorage lies to the eastward and southward of St. Martins Islands; charted depths of 3 1/4 to 4 fathoms lie about 1 mile off the east side of the group.

ST. MARTINS REEF, a 4-mile long ridge of sunken rocks in a north-south direction, lies about 10 miles west-southwestward of Shahpuri Point. There is a rock awash on the south part of the reef; northward and southward of this rock depths range from 3 feet to 5 3/4 fathoms. The sea breaks over the reef in heavy weather or with a southerly swell.

NORTH DELAY SHOAL is a small patch of hard ground which lies about 6 1/2 miles southwestward of the south extremity of St. Martins Islands. The least depth over it is 3 3/4 fathoms.

SOUTH DELAY SHOAL is a ridge which lies about 8 miles southwestward of the south extremity of St. Martins Islands and about 2 miles southward of North Delay Shoal. The depths over it are irregular; the least depth that was obtained was 4 1/4 fathoms, but the shoal should not be crossed as pinnacles with less depths may exist.

SITAPAROKIA PATCHES lie between positions about 3 1/2 miles eastward and about 7 miles southeastward, respectively, of the south extremity of St. Martins Islands and about 6 miles off the coast of the mainland. Depths over the patches are less than 5 fathoms with a least depth of 1 1/2 fathoms over their north end. Between the south extremity of St. Martins Islands and Sitaparokia Patches there are depths of 5 to 7 fathoms.

ASIRGARH SHOAL, small and rocky with a depth of less than 6 feet, lies about 6 1/2 miles southwestward of Sitaparokia (20°33'N., 92°32'E.), which is on the mainland. Asirgarh Shoal also lies about 2 1/2 miles southeastward of Sitaparokia Patches. The sea breaks over the shoal at low water and in heavy weather. A patch with a depth of 5 1/4 fathoms over it lies 1 1/2 miles west-northwestward of Asirgarh Shoal.

5A-5 OYSTER ISLAND (20°12'N., 92°32'E.), about 12 1/2 miles west-southwestward of Foul Point, is low and sandy, and with the exception of a few coconut palms is devoid of vegetation. Low seawalls of boulders protect the east and west sides of the island from erosion. Oyster Island lies on the east

edge of a ledge of rocks from which foul ground with depths of less than 5 fathoms extends about 1 1/2 miles north-northwestward and about 3 1/2 miles southeastward of the ledge.

A pier, about 350 feet long and 12 feet wide and used for servicing the lighthouse, is located on the northeast side of the island.

MAYU (OYSTER ISLAND) LIGHT is shown from the center of the northeast side of the island. A flagstaff, some buildings, and low trees stand near the lighthouse.

TAYLOR SHOAL, with a least known depth of 4 1/4 fathoms, lies about 8 miles west-northwestward of Oyster Island. Less depths than charted may exist; vessels should avoid crossing Taylor Shoal. Patches with depths of 9 and 10 fathoms lie between Oyster Island and Taylor Shoal.

OYSTER REEF lies between 8 and 10 miles southeastward of Oyster Island. A depth of 4 feet has been reported over the reef; the least charted depth is 1 1/4 fathoms. A channel between the northwest edge of Oyster Reef and the foul ground which extends southeastward from Oyster Island has depths of 5 3/4 to 8 fathoms. The sea always breaks on Oyster Reef during bad weather or when there is any swell.

A red can BUOY with a staff and cage topmark is moored about 1 3/4 miles southward of Oyster Reef in a position about 12 miles southeastward of Oyster Island Lighthouse. The buoy is withdrawn from May 1 to November 1, annually.

HECKFORD PATCH lies about 14 miles southwestward of FAKIR POINT (20°07′N., 92°54′E.). The least charted depth over the patch is 5 1/4 fathoms; a depth of 4 1/4 fathoms has been reported. As the bottom is rocky and uneven, vessels should not attempt to cross this danger. PRAIN DAUNG (20°01′ N., 92°57′E.) (sec. 5A-19) bearing 080° leads northward and bearing 060° leads southward, respectively, of Heckford Patch.

Scattered depths of 9 and 10 fathoms lie between the 20- and 10-fathom curves about 2 1/2 to 8 miles northwestward and 8 to 12 miles westward, respectively, of BORONGA POINT (19°49′N., 93°02′E.); depths of 7 to 10 fathoms lie in an area about 6 to 9 miles southwestward of the above point. Discolored water, reported, is charted about 8 miles southwestward of Boronga Point; a depth of 9 fathoms, existence doubtful, is charted outside the 20-fathom curve about 13 1/2 miles southwestward of the point.

Shoal water and breakers have been reported in an area 8 to 9 miles southward of Boronga Point. According to previous reports, a mud volcano once existed in this vicinity in approximately 19°40′N., 93°02′E. and left this shoal water area of about 2 1/2 miles in extent, westward of the above position. Depths of 9 and 10 fathoms lie within 1 mile northward and northeastward and depths of 8 to 10 fathoms lie up to nearly 4 miles southeastward, respectively, of the shoal water area.

5A-6 THE TERRIBLES, three groups of rocks, lie on the south side of the west approach to Kyankpyu Harbor. They lie between 8 miles west-northwestward and 10 1/2 miles west-southwestward of Saddle Island (Pyu Kyun) 19°26′N., 93°27′E.).

NORTH TERRIBLE (19°27′N., 93°18′E.), the northernmost above-water rock of the group, is 12 feet high. Rocks which dry lie within 1 3/4 miles northward of it. THANTA (Thanda) LIGHT is shown from North Terrible. Another rock lies about 1/3 mile south-southwestward of North Terrible.

MIDDLE TERRIBLE, 14 feet high, lies about 1 1/4 miles southwestward of North Terrible. Drying rocks lie about 1 1/4 miles west-northwestward and 1 mile south-southwestward, respectively, of Middle Terrible.

SOUTH TERRIBLE, nearly 3 miles south-southwestward of Middle Terrible, consists of several low rocks, the highest being 12 feet.

SOUTH ROCK, about 1 1/2 miles southward of South Terrible, dries 6 feet. Breakers are charted between South Terrible and South Rock.

VOLCANIC ERUPTIONS have been reported to have occurred about 3 1/4 miles north-northwestward of North Terrible. Shoal water may exist in this vicinity.

A SHOAL, formed by a mud volcano, lies about 4 1/2 miles southwestward of North Terrible; the depth over the shoal is 4 1/4 fathoms. Its position was marked by discolored water, but as the shoal area may have increased, this area should be avoided.

IRRAWADDY ROCK, which dries 2 feet,

lies about midway between Middle Terrible and Saddle Island. The rock is on the southwest edge of a shoal which has depths of less than 5 fathoms. In a smooth sea the rock is not easy to distinguish. A shoal, over which the sea breaks, lies about 1/3 mile east-northeastward of Irrawaddy Rock. A MUD VOLCANO was observed about 3 3/4 miles southward of Irrawaddy Rock.

Depths of 6 3/4 to 10 fathoms are charted over a rocky bottom about 2 1/4 miles northward of North Terrible. A depth of 9 fathoms lies about 4 miles northwestward and a depth of 10 fathoms lies about 6 1/4 miles west-northwestward, respectively, of North Terrible. Scattered depths of 8 to 10 fathoms are charted within a radius of 9 1/2 miles, southeastward to southward of North Terrible. The above depths mentioned in this paragraph lie between the 20- and 10-fathom curves.

RESEARCH ROCK, a sunken reef with depths of less than 1 fathom to 4 1/2 fathoms, lies about 3 miles south-southwestward of West Point (19°22'N., 93°28'E.), located on the seaward side of the northwest extremity of Ramree Island.

WRECKS.—Dangerous sunken wrecks are charted about 9 1/4 and 14 miles, respectively, west-southwestward of Fakir Point. The latter wreck lies about midway between Oyster Reef and Heckford Patch.

NAVIGATION

5A-7 Vessels should not approach The Terribles from the southward within depths of less than 20 fathoms or from the westward within depths of less than 24 fathoms, unless bound for Kyaukpyu Harbor or Cheduba Strait. At night the The Terribles should be given a wide berth.

TIDES—TIDAL CURRENTS

5A-8 Tides along the coast between Elephant Point and Thames Point are semidiurnal.

For tidal currents along the above coast, see section 5-4. Tidal currents of a local nature are discussed along with other features of the various localities.

WINDS—WEATHER

5A-9 See section 5-3.

COASTAL FEATURES—LANDMARKS

5A-10 BETWEEN ELEPHANT POINT and the entrance of the Naf River, about 33 miles south-southeastward of Elephant Point, the west side of the Naf Peninsula forms the coastline.

The NAF PENINSULA, a strip of land 2 to 5 miles wide, lies between the Naf River and the sea. The peninsula terminates in Shahpuri Island, which is low, fla, and covered with jungle. SHAHPURI POINT (20°43'N., 92°22'E.), the south extremity of Shahpuri Island, is located on the northwest side of the entrance of the Naf River. Naf Peninsula is marked by a range of hills which parallel the coast between Elephant Point and a position about 11 miles north-northwestward of Shahpuri Point. TAUNGNYO (Quoin Hill), 876 feet high, rises 2 miles inland about 11 miles southeastward of Elephant Point. About 9 miles south-southeastward of Taungnyo is a conspicuous peak, 830 feet high.

Eastward of the Naf Peninsula the Mayu Range attains heights of from 1,000 to 2,260 feet. WETKYEIN (Walkyeing) TAUNG, 1,509 feet high and about 19 miles eastward of Elephant Point, rises at the north end of the Mayu Range.

A ledge of rocks extends nearly 1/3 mile westward from Elephant Point. Along the seacoast of the Naf Peninsula, between Elephant Point and Shahpuri Point, the depths within the 10-fathom curve decrease gradually towards the shore, generally over a mud bottom.

SHAHPURI FLAT, composed of mud and sand and with depths of from 1 fathom to 3 fathoms, extends southward from the shore from a position about 9 miles north-northwestward of Shahpuri Point to a position about 5 miles southwestward of the point. There is usually a heavy sea on Shahpuri Flat which often breaks in depths of 2 fathoms. The south part of the flat lies on the northwest side of the entrance of the Naf River.

NAF (NAAF) RIVER

5A-11 The entrance of the Naf River lies between Shahpuri Point and Cypress Point, about 1 1/2 miles southeastward of Shahpuri Point. Conspicuous trees stand about 4 1/2 miles northwestward and 1 mile west-northwestward, respectively, of Shahpuri Point.

Cypress Point is low and sandy; Cypress Clump, close within the point, consists of casuarina trees about 80 feet high. Best Clump, also about 80 feet high, stands about 3 miles southeastward of Cypress Clump and is the most conspicuous clump southeastward of the entrance of the Naf River.

TIDAL CURRENTS.—The tidal currents set across the approach to the bar, the flood current to the northward and the ebb to the southward at velocities of 3/4 to 1 knot at spring tides. Tidal currents run mainly fair in Patricks Gut. In the Naf River the tidal current runs full at velocities up to 4 knots. There is little or no river current.

DEPTHS—DANGERS.—CYPRESS SANDS are a number of shallow ridges, several of which dry in places, lying on the flat which extends about 4 miles southwestward from Cypress Point. Depths over the sands are less than 2 fathoms; the sea breaks over them indicating their location. Depths adjacent to Cypress Sands are less than 3 fathoms; scattered depths of less than 3 fathoms lie between Shahpuri Flat and the north extremity of St. Martins Islands.

Shahpuri Flat and Cypress Sands join, forming the bar which obstructs the entrance of the Naf River.

In 1960 the least charted depth over the Shahpuri Flat part of the bar northward and northwestward of Cypress Sands was about 10 1/2 feet (MLWS); the least depths in Patricks Gut and in the deepest channel between the ridges of Cypress Sands were about 8 feet (MLWS).

For a distance of 12 miles within the entrance of the Naf River there were in 1960 charted depths of about 3 to 8 fathoms (MLWS).

BUOYS.—A red buoy, moored about 2 3/4 miles south-southwestward of Cypress Point, marks the east side of the entrance of Patricks Gut. A black buoy, moored about 4 3/4 miles southwestward of Shahpuri Point, marks the entrance of the channel which leads northward of St. Martins Islands and Cypress Sands. The buoys may be shifted to meet changes in the channels; buoys may also be removed annually during the Southwest Monsoon.

CHANNELS.—Two channels lead across the bar to the river entrance. The southeast channel leads in a northerly direction through Patricks Gut, thence through Cypress Sands. The northwest channel leads in an easterly direction and lies northward of St. Martins Islands and Cypress Sands.

DIRECTIONS.—Vessels should approach the entrance of the southeast channel (Patricks Gut) by passing southward and eastward of St. Martins Islands. Patricks Gut, close southward of Cypress Sands, is well sheltered from swell, and passage should be possible during the Southwest Monsoon. The approach to the entrance of the northwest channel should be made from the northwestward, passing northward of St. Martins Reef and St. Martins Islands. A midchannel course may be steered in the river.

Local knowledge or the services of a pilot is essential to enter the river.

ANCHORAGE.—Anchorage in the river in about 4 1/2 fathoms may be had off Maungdaw, about 7 miles within the entrance of the Naf River.

MAUNGDAW has sea communication with Akyab and Chittagong from the end of November to the end of April. There is a post and telegraph office at Maungdaw.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5A-12 BETWEEN CYPRESS POINT AND FOUL POINT (20°16′N., 92°45′E.) the Mayu Range with its numerous sharp peaks backs this section of the coast. The Mayu Range terminates 3 miles northwestward of Foul Point in Fakirmura Hill, 436 feet high and conspicuous. MOUNT TODD, 1,109 feet high, rises about 4 1/4 miles north-northwestward of Fakirmura Hill and when viewed from the westward appears to have a flat-topped summit, slightly higher than the peaks on either side. Viewed from the southward, Mount Todd appears as a conspicuous sharp peak.

AGANDU HILL, 631 feet high and with a pagoda on its flat summit, is located about 7 miles east-northeastward of Fakirmura Hill.

Pimple Hill, 354 feet high, is about 1 1/2 miles southeastward of Agandu Hill.

BENGARA PEAK, 1,356 feet high, rises about 19 miles northeastward of Fakirmura Hill; it is conspicuous and when open southward of the latter hill is easily identified.

SITAPAROKIA, a small conical hill 214 feet high and with the ruins of a temple on its summit, is located on a point 13 miles southeastward of Cypress Point. A conspicuous rack, 120 feet high and shaped like a chair, lies about 200 yards offshore about 1/2 mile northwestward of Sitaparokia. A rock, over which there is a depth of 1 3/4 fathoms, lies about 1 1/2 miles offshore and nearly 2 miles south by west of Sitaparokia.

There are depths of 4 1/4 to 6 1/2 fathoms between Sitaparokia Patches and the mainland; between Asirgarh Shoal and the mainland the depths are 6 to 7 fathoms.

A FLAT with depths of less than 3 fathoms extends from close off the coast from a position about 8 miles northwestward of Foul Point to a position about 7 1/2 miles south-southwestward of the point, where it terminates in North Spit. The southeast edge of the flat and North Spit lie on the northwest side of the entrance of the Mayu River.

MAYU RIVER

5A-13 The entrance of the Mayu River lies between Foul Point and Mayu Point (20°12'N., 92°46'E.), about 4 miles south-southeastward of Foul Point. About 4 miles northward of Mayu Point the Kywede River, flowing from the eastward, joins the Mayu within its entrance. The Mayu, which flows almost due south, is divided into two channels for a distance of about 9 miles within its entrance by Kazidiya Kyun (Pawkyunthi Island) and a shoal which extends southward from the island. The Mayu River has been surveyed for a distance of 12 miles from its entrance and the Kywede River for a distance of 4 miles from its jointure.

TIDAL CURRENTS.—The tidal currents at the bar have a velocity of about 2 1/2 knots at spring tides and 1 1/2 knots at neap tides. The flood current sets north-northeastward and the ebb current in the opposite direction.

In the Mayu River tidal currents attain a velocity of 3 1/2 knots at spring tides.

DEPTHS—DANGERS.—The bar at the entrance of the Mayu River lies between the outer ends of North Spit and South Spit, about 4 1/2 miles southwestward of Mayu Point. There is a least depth of 19 feet over the bar.

Dangers on the northwest side of the entrance include North Spit (sec. 5A-12) Martini Sands, and Burne Rocks. Between Foul Point and Burne Rocks, which lie about 1 1/2 miles southward of Foul Point, there are numerous patches and rocks which dry from 2 to 8 feet; this stretch of foul ground is fairly steep-to on its east side.

Burne Rocks, one of which is 3 feet high, dry from 1 foot to 4 feet in places. Two unnamed islets lie off Foul Point; one lies about 1 1/4 miles southward and the other about 1 1/4 miles westward of the point. Burne Rocks lie off the east extremity of the easternmost islet.

Martini Sands, which extend about 3 miles southward and south-southwestward from Burne Rocks, constantly change; inside the breakers, the sands are awash at low water springs.

Dangers on the southeast side of the entrance consist of South Spit and Mayu Spit and the flat of which they are adjacent to or a part thereof. The flat, with depths of less than 3 fathoms, extends at distances up to 4 1/2 miles southwestward from Mayu Point and the coast southeastward of the point; South Spit is the termination of this flat. Mayu Spit, awash at low water springs, extends along the northwest edge of the flat for about 2 miles southwestward from Mayu Point.

Depths inside the bar increase from 19 feet to over 5 fathoms; westward of Mayu Point, depths range from 9 to 11 fathoms.

In the Mayu River channel from abreast of Burne Rocks to Foul Point, charted depths decrease from 10 to 4 fathoms. The eastern channel, eastward of Kazidiya Kyun and the shoal extending southward from the island, had a least depth of 18 feet in past years; the western channel, westward of the island and the shoal, had a least depth of 19 feet.

Fishing stakes obstruct much of the eastern channel, but it is easier to navigate; the entrance of the western channel is narrower and dangerous.

Depths of 5 to 7 fathoms are charted in the fairway of the Kywede River for about 4 miles above its junction with the Mayu River.

A 1945 report indicated that considerable shoaling had occurred at that time in the eastern channel of the Mayu River northeastward of Foul Point and at the junction of the Mayu and Kywede Rivers.

ANCHORAGES.—Good anchorage can be taken in 6 to 10 fathoms in the channel eastward of Burne Rocks. Anchorage may also be obtained in the channel between Foul Point and the edge of the shoal that extends southward from the point which divides the Mayu and Kywede Rivers at their juncture.

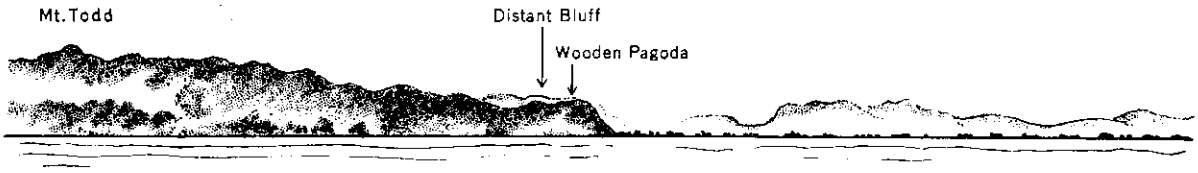
Anchorage is afforded in the Mayu River about a 1/4 mile off the west bank in 4 fathoms, opposite the town of Rathedaung, about 12 miles northward of Foul Point. Anchorage may also be obtained about a 1/4 mile off the east bank in 5 fathoms in a position 2 1/4 miles southward of Rathedaung and close southward of the entrance of Nganabya Creek.

DIRECTIONS.—A distant bluff in range with a wooden pagoda, atop a 271-foot elevation and difficult to identify, bearing 001° leads across the bar between North Spit and South Spit. The pagoda stands nearly 3/4 mile eastward of Fakirmura Hill (sec. 5A-12). When Bengara Peak is in range with Pimple Hill (sec. 5A-12) bearing 032°, these landmarks should be steered for on the above bearing until Mayu Point bears 158°, at which position course should be altered to the northward so as to pass about 1/2 mile eastward of Burne Rocks.

RATHEDAUNG, a town on the east bank of the Mayu River, is located about 16 miles northward of Mayu Point. The town also fronts the north bank of Rathedaung Creek close within its entrance. There is a post and telegraph office at Rathedaung. Launch service is maintained to Akyab.

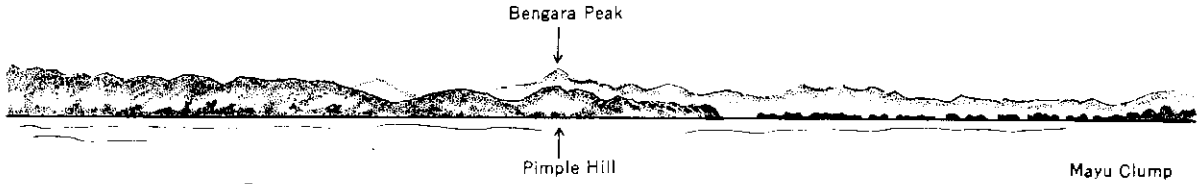
KALADAN RIVER—AKYAB HARBOR (20°08′ N., 92°54′E.)

5A-14 FAKIR POINT (20°07′N., 92°54′E.), on the northwest side of the entrance of the Kaladan River, is about 10 miles southeast-



MAYU RIVER

Distant bluff over wooden pagoda, bearing 001° leads over outer bar



Bearing 032° and in range with Bengara Peak, leads through entrance channel

MAYU RIVER ENTRANCE

ward of Mayu Point. The entrance of the Kaladan River lies between Fakir Point and Savage Island, located about 1 1/2 miles southward of Fakir Point. Akyab Harbor is located just within the entrance, northward of Fakir Point.

NAVIGATION

5A-15 Vessels are prohibited from entering or leaving Akyab Harbor between sunset and sunrise.

Vessels entering the harbor during the flood current, when in the vicinity of White Rocks, require careful navigation as the current sets directly towards the rocks. When leaving the harbor on the ebb current, vessels should keep as close to White Rocks as practicable to prevent being set on Horseshoe Shoal. Caution is advised.

WINDS—WEATHER

5A-16 The Southwest Monsoon begins early in May and lasts until the end of October, during which period the rainfall is so heavy as to almost inundate the country. The rivers become swollen at this time. Vessels do not normally load in Akyab during this period.

The Northeast Monsoon, from November to April, is very dry. During the winter months thick fog may be expected with the flood tide.

For a table of meteorological data for Akyab see the Appendix.

STORM SIGNALS.—Storm and weather signals in accordance with the Indian Extended System are displayed at Akyab. See section 1-34.

TIDES—TIDAL CURRENTS

5A-17 Tides in the entrance of the Kaladan River and at Akyab are semidiurnal.

The tide rises and falls quickly; slack water lasts about 1 hour during springs and from 2 to 3 hours during neaps.

During the rainy season the mean level of the Kaladan River rises about 2 feet.

TIDAL HEIGHTS ABOVE *CHART DATUM.—MHWS 7.9 feet, MLWS 0.5 feet; MHWN 5.6 feet, MLWN 2.7 feet. *H.O. Chart 3707.

TIDAL CURRENTS.—The tidal currents are regular and rapid at springs; overfalls form on the ebb current running between Fakir Reef and Passage Rock. The velocity at springs on the outer bar is from 3/4 knot to 2 knots, but between Fakir Point and Passage Rock the velocity is 3 to 4 knots and during the Southwest Monsoon as much as 7 knots. During neaps the tidal currents are very weak.

The tidal currents set directly across Fakir Reef and a vessel leaving an inner anchorage when the ebb current is running will be set towards the reef after passing Fakir Point.

The flood current sets directly towards White Rocks.

DEPTHS—DANGERS

5A-18 The outer bar lies between the west coast of Myengun Kyun (West Boronga Island), located southeastward of Fakir Point, and the tongue-shaped spur of Horseshoe Shoal with depths of less than 3 fathoms, which lies about 4 miles southward of Fakir Point. In 1964 the least depth in the fairway over the outer bar was 24 feet; within the outer bar the depths increase. During the Southwest Monsoon vessels crossing the outer bar should have 3 to 4 feet of water under their keels on account of the swells.

The inner bar lies within the entrance of the Kaladan River between the mainland northward of Fakir Point and the southwest end of Flat Island Spit, the shoal with depths of less than 3 fathoms which extends south-southwestward from Ngapi Kyun (Flat Island) to a position about 1 mile northeastward of Fakir Point. In late 1964 the least depth over the inner bar was 17 feet. Silting is a problem; dredging facilities are inadequate.

Northward of the Main Wharf, located in the Inner Harbor about 1 3/4 miles northward of Fakir Point, charted depths are irregular, being 20 to 30 feet.

Horseshoe Shoal, an extensive flat with depths of less than 3 fathoms, fronts the coast between Fakir Point and a position about 5 1/2 miles west-northwestward of the point. The shoal extends southward and south-southwestward for about 4 1/2 miles offshore, thence from its outer southeast part a tongue-shaped spur extends 3 miles farther to the eastward. During the Southwest Monsoon, the sea breaks heavily over the outer part of Horseshoe Shoal and its spur on the west side of the outer bar.

Savage Island, 65 feet high, is located on the southeast side of the entrance, nearly 1 3/4 miles southward of Fakir Point.

White Rocks, 22 feet high, lie on the east side of the entrance between 1/3 mile southward and 1 mile south-southeastward of Savage Island. Between White Rocks and the northwest extremity of Myengun Kyun are shallow flats that dry in places.

Peaked Rocks, the largest of which is 10 feet high, lie on the east side of the entrance with the outermost rock about 1/3 mile southwestward of Savage Island.

Passage Rock, an off-lying danger 14 feet high, lies on the southeast side of the entrance about 1/4 mile northwestward of Savage Island. Other off-lying dangers on the southeast side of the entrance consist of a rock with a depth of 28 feet which lies about 200 yards northward of Passage Rock, a rock with a depth of 19 feet nearly 1/2 mile north-northeastward and a rocky shoal with a least depth of 6 feet a little more than 1/2 mile northeastward, respectively, of Savage Island.

Fakir Reef, on which there are rocks which dry 3 feet, extends nearly 1/2 mile south-southeastward from Fakir Point; the reef along with the northeast part of Horseshoe Shoal constitute dangers on the northwest side of the entrance.

Jacks Reef, a danger inside the 3 fathom curve within and on the southeast side of the entrance, dries to 5 feet about 1 1/2 miles east-northeastward of Savage Island. A sunken rock is charted about 400 yards northwestward of Jacks Reef; the north edge of a flat which dries lies about midway between Savage Island and Jacks Reef.

Saunders Shoal, another danger within the entrance with depths of 18 to 24 feet, lies in the middle of the river in an east-northeastward direction for about 1 1/4 miles from a position a little more than a mile eastward of Fakir Point. Close northwestward of the central part of Saunders Shoal there are depths of from 22 to 24 feet over an area nearly 1/2 mile long and a 1/4 mile wide.

Ngapi Kyun (Flat Island), low and covered with brushwood, is also located in the middle of the river with its south side being about 5 1/4 miles northeastward of Fakir Point. Flat Island Spit, an extensive mud shoal which dries in places, extends for about 4 1/4 miles southwestward from the south side of Ngapi Kyun. The southwest end of the spit, with depths of less than 3 fathoms terminates on the east side of the inner bar, about 1 mile northeastward of Fakir Point. The west side of Flat Island Spit forms the east side of the Inner Harbor and lies at a distance of about 1/2 mile off the length of the Akyab shoreline. Fishing stakes cover the spit.

WRECKS.—A wreck, dangerous to navigation, is located about 1 1/4 miles north-northeastward of Fakir Point.

A stranded wreck, 100 feet in length, lies 100 yards southward of the head of the stone pier located 600 yards southward of Main Wharf.

A wreck lies stranded in the foul ground area located about 1 1/4 miles northeastward of Main Wharf.

ASPECT—LANDMARKS

5A-19 The coast between Mayu Point and Fakir Point is very low, swampy, and interspersed with paddy fields. FAKIR POINT is low and backed by low ground covered with coconut trees. Two RADIO MASTS of a naval communication facility and a lookout TOWER stand on Fakir Point and are conspicuous from seaward. SITTWE (FAKIR POINT) LIGHT TOWER, a square metal framework structure, stands on Fakir Point.

LAY CHUNTAUNG (SAVAGE ISLAND) LIGHTHOUSE, circular and white, stands on the northwest side of Savage Island and serves as a useful daymark.

Myengun Kyun (West Boronga Island) is about 17 miles long in a south-southeast-north-northwest direction between Hodge Point (20°04'N., 92°55'E.) and Boronga Point, its south extremity. The island is mostly high and densely wooded. PRAIN DAUNG (Laule Taung) (Beacon Hill), a tableland located about 4 miles south-southeastward of Hodge Point, is 962 feet high and conspicuous from seaward except from the south-southeastward, where it is obscured by a mountain 1,135 feet high. The latter appears as a sharp peak when observed from the southward, from the westward it appears as a saw-toothed ridge, having no conspicuous summit. SOUTH HUMMOCK, a hill 240 feet high and near the south end of Myengun Kyun, is

conspicuous when seen from the westward. Nearly 3 miles northward of South Hummock a WHITE PAGODA stands on a low hill near the west coast of the island; PAGODA SUMMIT, 740 feet high, backs the low hill and the white pagoda. The west coast of Myengun Kyun is rock-fringed and dangerous.

NAVIGATIONAL AIDS

5A-20 SITTWE (FAKIR POINT) LIGHT is shown from Fakir Point.

LAY CHUNTAUNG (LAY-CHAN-TAUNG) (SAVAGE ISLAND) LIGHT is shown from Savage Island.

BEACONS.—A concrete pillar beacon, 37 feet high and with a cage topmark, stands on White Rocks a little more than 1/2 mile southward of Lay Chuntaung Lighthouse. Another beacon stands close eastward of Savage Island.

Along the west side of the harbor, between Fakir Point and a position about 4 1/4 miles north-northeastward of the point, numerous pairs of beacons and several single beacons stand on the shore. Their positions can best be seen on the chart.

BUOYS.—A light buoy, painted black, is moored about 400 yards southeastward of Fakir Reef and about 2/3 mile south-southeastward of Fakir Point.

A light buoy is moored close westward of the dangerous wreck which lies about 1 1/4 miles north-northeastward of Fakir Point. This buoy is moored in the vicinity of the inner bar and the southwest end of Flat Island Spit.

A black can buoy is moored near the southwest end of Saunders Shoal, about 1 1/4 miles eastward of Fakir Point.

Two can buoys, one moored about 3/4 mile northeastward and the other about 2 miles north-northeastward, respectively, of the Main Wharf, mark the east side of the fairway in the Inner Harbor which is part of the west branch of the Kaladan River. Similarly, two can buoys mark the west side of the fairway a little more than 1/2 mile and 1 3/4 miles north-northeastward, respectively, of the Main Wharf.

The passage up the west branch of the Kaladan River, as well as the entrances of Charugyea and Mingan Chaungs (Creeks) and the narrow and shallow channel between Ngapi Kyun and Paw Kyun, a low island close northward of Ngapi Kyun, are marked by buoys.

RADIOBEACON.—Akyab aeronautical radiobeacon transmits from an approximate position about 1 1/2 miles northwestward of Fakir Point.

HARBOR

5A-21 Critical depths due to siltation necessitate the designation of an Outer Harbor at Akyab. The Outer Harbor is located within the entrance of the river and outside or seaward of the inner bar; in general the Outer Harbor occupies an anchorage area east-northeastward of Fakir Point which lies between the inner bar and Flat Island Spit on the north and Saunders Shoal on the south.

The Inner Harbor fronts Akyab and occupies the main entrance and fairway area of the west branch of the Kaladan River just within and northward of the inner bar. The limiting length of a vessel in the Inner Harbor is 450 feet.

ANCHORAGES

5A-22 As silting may have occurred, it is advisable to obtain local information before anchoring.

Outside the outer bar, temporary anchorage or anchorage while waiting to pick up a pilot, can be taken in 7 or 8 fathoms about 4 miles southward of Savage Island. This anchorage may not be practicable during the Southwest Monsoon.

When necessary, vessels can anchor in the Outer Harbor outside the inner bar. Good anchorage berths lie northward of Saunders Shoal Buoy in depths of 22 to 31 feet. The ebb tide, which runs with considerable velocity in this vicinity may cause vessels to drag their anchors. It is recommended that 8 shackles of cable be veered when anchoring anywhere within Fakir Point.

Merchant vessels usually anchor in the Inner Harbor westward of Flat Island Spit between the Main Wharf and Charugyea Chaung, close offshore. Vessels drawing less than 18 feet can anchor abreast of the hospital, about 1/4 mile southward of Main Wharf.

PROHIBITED ANCHORAGE.—Anchorage is prohibited in the area lying between the tanker berth (sec. 5A-25) and the shore.

PILOTAGE—PILOTS

5A-23 Pilotage is compulsory for all vessels.

Licensed Burmese pilots are stationed at Fakir Point, on which there is a lookout tower. Pilots board from a white motor launch about 4 miles southward of Savage Island.

Port authorities must be given 48 hours advance notice of a vessel's time of arrival.

DIRECTIONS

5A-24 Deep-draft vessels approaching from the westward during the Southwest Monsoon should steer 091° toward Prain Daung (Beacon Hill) (sec. 5A-19) on Myengun Kyun, which course leads between Oyster Reef and Heckford Patch (sec. 5A-5) to the entrance range over the outer bar.

The beacon on White Rocks in range with Lay Chuntaung (Savage Island) Lighthouse and bearing 350° leads vessels over the outer bar. After crossing the outer bar, a course of about 330° should be steered from a position about 1 1/4 miles southward of the beacon on White Rocks; this course leads nearly 1/2 mile westward of the beacon on White Rocks and about 1/3 mile westward of Peaked Rocks. When westward of Savage Island course should be altered to pass about 1/4 mile northwestward of Passage Rock, thence a course of about 060° will pass about 1/3 mile southeastward of the buoy moored off Fakir Reef and leads to a position with Sittwe (Fakir Point) Light Structure bearing 315°, distant about 1 mile. Then course should be shaped to the northward between Fakir Point and Saunders Shoal, thence to the inner bar or to the anchorage in the Outer Harbor.

The strong set southward and westward of the ebb tidal current must be kept in mind; vessels should be kept well up after passing the buoy off Fakir Reef and before turning toward the inner bar or the anchorage.

See section 5A-15.

FACILITIES

5A-25 AKYAB, the chief port and administrative center of the Arakan Division of Burma, is situated on the southeast side of the low and wooded island which lies between the entrances of the Mayu and Kaladan Rivers. The port, located just within the entrance of the Kaladan River, is Burma's oldest rice exporting port and ranks fourth after Rangoon, Bassein, and Moulmein. Exports consist chiefly of rice and rice bran; other exports include general cargo and petroleum. Akyab had an estimated population of 62,000 in 1961.

BERTHS.—Main Wharf, about 1 3/4 miles northward of Fakir Point, is a T-head pier with a berthing length of 324 feet along its outer face. In 1964 reports stated there was a least depth of 11 feet alongside the outer face and that dredging was in progress to provide a depth of 18 feet alongside.

Supplemental wharves include Naval Pier at Fakir Point, Stone Pier about 600 yards southward of Main Wharf, Burmah Oil Company Pier about 1 1/3 miles northward of Main Wharf and just within the entrance of Charugyea Chaung, and several smaller landings and marginal wharves. In 1963 it was reported that Main Wharf was the only commercial wharf in use on the river front and that all the other wharves and piers were silted-up.

There are numerous anchorage berths in the Inner and Outer Harbors.

A tanker berth, 500 feet long, is located close southward of the entrance of Charugyea Chaung and 1 mile northward of Main Wharf. A pipeline extends from the shore in a 110° direction at the berth.

HARBOR CRAFT.—Harbor craft include a number of small tugs and launches, one small dredge, several diesel-powered craft of from 110 to 220 hp., 15 to 20 lighters and barges, and a water barge.

CARGO INFORMATION.—Five vessels moored to their own two anchors in the Inner Harbor can be loaded simultaneously to drafts of 21 feet.

Because of silting of the inner bar, vessels may be required to move to the Outer Harbor to complete loading. Five vessels moored to single anchors can be worked in the Outer Harbor for topping-off or lightening operations. Vessels load to 26 feet in the Outer Harbor.

Vessels use their own gear in handling cargo. Lack of an adequate supply of lighters

may limit the number of vessels that can be worked simultaneously. Port cargo handling equipment includes a 1-ton steam mobile crane and a 7-ton steam stationary crane.

In general, Akyab has an adequate amount of covered storage space. A small amount of refrigerated space is available at two ice plants.

A 1964 report states that all imports are received at Rangoon and reshipped up the coast on a monthly average tonnage basis.

PROVISIONS.—Fresh meat, fish, fruit and vegetables, and staples are obtainable in limited quantities. Rice is plentiful.

DECK AND ENGINE SUPPLIES.—Deck supplies are scarce; engine supplies are unobtainable.

FUEL OIL.—Akyab is not a bunkering port; limited quantities of fuel and diesel oils are obtainable in drums and available mostly to local craft.

COAL.—A small supply of coal is maintained.

WATER.—Water is supplied by barge at a delivery rate of about 20 tons per hour. It should be boiled before drinking or filtered for boiler use. An advance notice of 72 hours must be given to obtain water.

REPAIRS.—Repairs to hull and machinery of river and small coastal vessels can be made at the government dockyard. The yard has one slipway and two side slips. Each slip is capable of handling 200-ton vessels up to 150-feet in length.

Another dockyard, capable of accommodating vessels up to 140 feet in length and 300 tons displacement, is located on Charugyea Chaung.

COMMUNICATIONS.—Regular sea and air communication with Calcutta and Rangoon is maintained. A system of inland water transportation exists throughout the district.

Akyab is connected with the main telegraph system of India.

MEDICAL.—A hospital at Akyab has limited facilities.

Akyab is subject to epidemics of cholera and malaria is endemic.

A copy of the special quarantine regulations should be obtained from the harbor authorities.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5A-26 BORONGA POINT (19°49'N., 93°02'E.) is the south extremity of Myengun Kyun (sec. 5A-19). A narrow ledge of rocks, some of which dry, extends about 1 mile southward from the point.

The broken and irregular coast between Boronga Point and Ramree Island, about 35 miles southeastward of the point, is deeply indented by Hunters and Combermere Bays.

PEINNECHAUNG KYUN (Middle Boronga Island), high and thickly wooded, lies 1 mile to 6 miles eastward of Myengun Kyun and roughly parallel with it.

RESEARCH STRAIT, between Myengun Kyun and Peinnechaung Kyun, affords sheltered passage especially during the Southwest Monsoon, for boats and small craft with local knowledge. There is deep water in the south end of the strait, but shoals encumber the north end where it joins the Kaladan River, southeastward of Akyab. A shoal with a depth of 3 1/4 fathoms, formed by the action of a mud volcano, lies in Research Strait about 2 1/4 miles eastward of South Hummock, a hill 240 feet high near the south extremity of Myengun Kyun.

A chain of small islands, rocks, and foul ground extends about 7 miles south-southeastward from the south extremity of Peinnechaung Kyun. Painaisa Island, 190 feet high, and Conspicuous Rock, 30 feet high, are easily distinguished. The chain ends in Bingham Rock, which dries 3 feet.

INGRINCHAING KYUN (East Boronga Island) lies about 3 1/2 miles eastward of and parallel with Peinnechaung Kyun. Ingrinchaing Kyun is inconspicuous from seaward.

LINLOK KYUN (Calder Island), a small island 263 feet high, is located about 1/2 mile southeastward of the south end of Ingrinchaing Kyun. Detached shoals, sunken rocks, and rocks above water extend about 4 miles southeastward from Linlok Kyun.

The entrance of HUNTERS BAY lies between Linlok Kyun and KYUNTHAYA (Elizabeth Island), about 9 miles southeastward of Linlok Kyun. Hunters Bay is very shallow

with numerous channels and of no importance to ocean vessels.

KYUNTHAYA, bold and high, has an elevation of 860 feet on its northwest end, the most conspicuous part of the island.

RETKAMAUK TAUNG (Keuain Kaun Taung) (19°48'N., 93°28'E.), a conspicuous peak, rises to an elevation of 1,576 feet about 4 1/2 miles northeastward of the northwest extremity of Kyunthaya. From the southward the peak is sometimes visible for 45 miles in clear weather.

The entrance of COMBERMERE BAY lies between the southeast side of Kyunthaya and the north point of Nakhaungbauk Kyun (Satellite Island), about 6 1/2 miles southward of the southeast extremity of Kyunthaya. Nasapo Kyun, 365 feet high and conspicuous, is located about 2 1/4 miles southeastward of Kyunthaya; the wedge-shaped island makes a good landmark. Naungdaw Kyun, 1 mile eastward of Nasapo Kyun, attains an elevation of 840 feet in the conspicuous cone-shaped summit of Seppings Peak. The peak has a gradual southeastward slope.

Black Rocks, which dry 8 feet, lie in the entrance of Combermere Bay about 2 3/4 miles south-southwestward of the southeast extremity of Kyunthaya.

Many islands and islets and numerous dangers lie within the entrance of Combermere Bay. Navigation of the bay is intricate and dangerous; only native craft attempt it as a rule.

Temporary open anchorage in depths of 7 to 9 fathoms, mud, and good holding ground may be obtained off the entrance of Combermere Bay.

KYAUKPYU HARBOR (19°27'N., 93°34'E.)

5A-27 KYAUKPYU HARBOR is located between Tankharo Island on the south side of Combermere Bay and the north side of the northwest end of Ramree Island. The harbor is open only to the west-northwestward and affords well-sheltered anchorage. The town of Kyankpyu is situated on the north shore of Ramree Island. Fletcher Hayes Strait leads off the east end of Kyaukpyu Harbor, thence eastward of Ramree Island and is part of a boat passage to Ramree Harbor, located about 32 miles southeastward of Kyaukpyu Harbor.

TIDES—TIDAL CURRENTS.—Tides in Kyaukpyu Harbor are semidiurnal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—MHWS 9.8 feet, MLWS 0.8 feet; MHWN 7.0 feet, MLWN 3.6 feet. *H.O. Chart 3708.

The velocity of the tidal current varies from 1 knot to 3 knots. Seaward of Saddle Island the flood current sets northward and the ebb current southward, frequently with considerable velocity. At neaps the currents are very weak. Between the islands the currents follow the directions of the channels.

DEPTHS—DANGERS—ASPECT—LANDMARKS.—Off-lying islands and dangers pertinent to the approach of Kyaukpyu Harbor are discussed in sections 5A-5 and 5A-6.

Myethpyu Kyun (Reef Island), about 3/4 mile southwestward of Nakhaungbauk Kyun, is the westernmost of a group of islands which lie on the north side of the entrance of Kyaukpyu Harbor. The island is fringed by a reef which extends about 300 yards from its northeast and southwest sides. Foul ground with rocks 3 to 5 feet high extends up to about 2 miles northwestward from Myethpyu Kyun; from the northwestward it is advisable for vessels not to approach the island closer than 3 miles. Myethpyu Kyun blends with the higher islands to the eastward and is conspicuous.

Kyu Kyun (Narkumbau Island) and Wet Kyun (James Island) are located about 3/4 mile and 1 3/4 miles, respectively, eastward of Myethpyu Kyun.

Tankharo Island, long, narrow and thickly wooded, separates Combermere Bay from Kyaukpyu Harbor. Catherine Bluff, the island's northwest extremity, is located about 2/3 mile south-southeastward of Kyu Kyun. About 6 miles southeastward of Catherine Bluff, the southeast end of Tankharo terminates in Barker Point.

5A-28 KYAUKPANDU (Pagoda Rock) (19° 29'N., 93°30'E.), 85 feet high, lies about 2 1/4 miles south-southwestward of Catherine Bluff. The rock, conical-shaped and topped by two sharp points close together, occasionally has its seaward side whitewashed which makes an excellent mark. Kyaukpandu is steep-to on its south and west sides; depths of 3 fathoms and less lie within a radius of about 2/3 mile northwestward through northward to eastward of the rock.

North Shoal, a small rocky patch, lies about 1 1/2 miles south-southeastward of Kyaukpandu; the north part of the shoal dries 2

feet while the southeast part has a least depth of 2 1/2 fathoms. A stranded WRECK lies on the north edge of North Shoal. A depth of 2 1/4 fathoms lies close north-northeastward off the north part of the shaol. Charted depths of 2 3/4 fathoms lie about midway between North Shoal and Kyaukpandu.

A shoal with depths of 4 1/4 to 4 3/4 fathoms is charted with its outer southwest part about 1 1/4 miles southwestward of Kyaukpandu.

GILES BANK, with a least depth of 3 3/4 fathoms, lies about 2 3/4 miles west-southwestward of Kyaukpandu and is the outermost danger on the north side of the entrance of Kyaukpyu Harbor.

Sinbaikchaing (Crooked Island) lies between Kyaukpandu and Tankharo Island. The island is generally low, but a wooded ridge, 60 feet high, runs from a position on the west side of the island for about 2/3 mile to the southeastward. A small pagoda stands on the northwest end of this ridge. Reefs and detached rocks fringe the west side of Sinbaikchaing. Foul ground extends nearly 3/4 mile northwestward from the northwest end of the island. A rock 4 feet high and breakers mark the outer part of the foul ground.

Squadron Rocks, low with scrub growth, lie about 300 yards westward of the south end of Sinbaikchaing. Sunken rocks lie about 1/3 mile south-southeastward of the southernmost rock, which is 15 feet high.

Ledaung Kyun (Quoin Island), thickly wooded, lies close southeastward of Sinbaikchaing and from seaward appears wedge-shaped, the northwest part of the island being the higher. A ledge extends about 200 yards southward from the south point of the island; southward of the extemity of this ledge the depths increase abruptly to 40 fathoms. The area between the east and south points of Ledaung Kyun dries about 5 feet. Between the south point of Ledaung Kyun and Barker Point, the southeast extremity of Tankharo Island and about 3 3/4 miles eastward of the south point of Ledaung Kyun, the area is filled by a shallow flat, the outer part of which has depths of less than 3 fathoms. A detached shoal, with a depth of 1 1/4 fathoms, lies about 1/2 mile eastward of the south point of Ledaung Kyun.

The shallow area between Tankharo Island on the east and Sinbaikchaing and Ledaung Kyun on the west dries in places.

Paungnetkyi (Laws Island), 519 feet high and covered with foliage, lies in the east part of Kyaukpyu Harbor, about 3/4 mile southeastward of Barker Point. A spit with depths of less than 3 fathoms extends about 1 mile westward from the northwest side of Laws Island.

5A-29 WOOD HARBOR (19°32'N., 93°31'E.), an anchorage lying between the islands on the north side of the entrance of Kyaukpyu Harbor, is entered from the westward between the south end of Kyu Kyun and Catherine Bluff, the northwest extremity of Tankharo Island.

To avoid the foul ground northwestward of Sinbaikchaing, vessels should approach the entrance of Wood Harbor with Catherine Bluff bearing not less than 094°. Depths of 3 and 3 1/2 fathoms lie close northward and about 300 yards northeastward, respectively, of Catherine Bluff. A rocky 5-fathom patch lies nearly 1 mile westward of Catherine Bluff. Depths in the approach to and in the entrance of Wood Harbor are irregular, ranging from 5 to 26 fathoms. In the harbor depths range from 4 1/2 to 27 fathoms.

Tidal currents set through the entrance of Wood Harbor at a velocity of about 3 knots.

Anchorage is afforded in Wood Harbor in 4 1/2 to 15 fathoms, mud, with the north edge of Tankharo Island bearing 274° and a gap in the hills, about 1/4 mile east-southeastward of Catherine Bluff, bearing 246°.

A boat channel leads from Wood Harbor to Kyaukpyu Harbor, passing close along the northeast coast of Tankharo Island; the use of this channel requires local knowledge.

5A-30 SADDLE ISLAND (Pyu Kyun) (19°26'N., 93°27'E.), located on the south side of the entrance of Kyaukpyu Harbor, has two rounded summits, sparsely covered with trees, near its north end. Numerous sunken reefs surround the island; foul ground, over which the sea breaks on the outer edge, extends nearly 1 1/2 miles westward from Saddle Island. A reef of sunken rocks and rocks above water extends 1 mile southward

to 1 1/4 miles south-southwestward of the island; this reef fronts the north side of Bowman Passage. Rocks, which dry and surrounded with depths of less than 3 fathoms, lie on the south side of Bowman Passage about 1 1/2 miles southward of the south end of Saddle Island. A detached rocky patch with a depth of 3 fathoms lies in Bowman Passage, about 1 1/4 miles south-southwestward of the south end of Saddle Island. A reef with sunken rocks, above-water rocks, and shoal depths extends about 1 1/4 miles northward from the north end of Saddle Island. Two small rocks, 6 and 5 feet high, lie on this reef nearly 1/2 and 3/4 mile, respectively, northward of the north end of Saddle Island.

Dicey Shoal, over which the sea breaks heavily, is the north extremity of the sunken-rock and shoal area which extends northward from the north end of Saddle Island.

Dickenson Channel, with depths of 8 to 11 fathoms, lies between Irrawaddy Rock (sec. 5A-6) and the foul ground which extends westward from Saddle Island.

Helen Passage, the channel between Saddle Island and Ramree Island, is not safe because of numerous reefs and rocky patches. A close approach to Saddle Island should not be made from any direction.

Cap Islet, 148 feet high and conspicuous, is located about 1 1/2 miles southeastward of Saddle Island. Knot Islet, about 1 mile north-northeastward of Cap Islet, is low, being only 6 feet high with some scrub growth. Both islets, surrounded by reefs, are located on and near the outer edge of the large foul ground area which extends about 1 1/2 miles northwestward from the northwest coast of Ramree Island lying between Adams Point and Shell Point, 2 1/4 miles northeastward of Adams Point.

5A-31 ADAMS POINT (19°24'N., 93°29'E.), the northwest point of Ramree Island, is low and backed by a ridge of hills. MOUNT PETER, a hill at the southeast end of the ridge, attains an elevation of 333 feet about 1/2 mile eastward of Adams Point.

The coast between Adams Point and Georgina Point, about 3 miles northeastward of Adams Point, and thence to Dalhousie Point about 2 miles farther eastward, is formed by a succession of sandy beaches interspersed with rocky points. Foul ground and shoal depths front the section of coast between Shell Point and Dalhousie Point at a distances up to 3/4 mile.

The northwest end of LADIES RIDGE, which stretches southeastward for 3/4 mile, is located about 1/2 mile southward of Georgina Point. Trees on the 218-foot high northwest end of the ridge are conspicuous from the westward.

Bombay Shoal, a rocky shoal area with depths of 1 1/2 to 3 fathoms, lies with its outer north edge nearly 3/4 mile north-northwestward of Georgina Point. The area southeastward of Bombay Shoal to the coast is foul. A detached 2 3/4-fathom patch lies about 1 1/4 miles west-northwestward of Georgina Point; another detached 2 3/4-fathom patch lies about 3/4 mile northeastward of the point.

Reliance Shoal, with a depth of 1 3/4 fathoms, lies nearly 1 1/4 miles northeastward of Georgina Point. Irregular depths surround Reliance Shoal; they range from 5 1/4 to 16 fathoms. A 4 1/4-fathom patch lies southward of Reliance Shoal and a little more than 1 mile northeastward of Georgina Point.

DALHOUSIE POINT, low and sandy, is well marked by high trees. The ruins of a fort and a large clump of palm trees stand on the point. A shoal with a least depth of 2 3/4 fathoms lies about 1/2 mile southeastward of Dalhousie Point. A dangerous WRECK lies sunk close off the northeast side of the above 2 3/4-fathom shoal. A green conical buoy, moored close north-northwestward of the wreck, marks this danger.

The north part of Ramree Island, which forms the south side of Kyaukpyu Harbor, is thickly wooded. A sandy beach with a foreshore of mud, which dries out at distances up to about 1/4 mile from the shore, lies on the south side of he harbor between Dalhousie Point and the entrance of Ngalapwe Chaung (Creek), nearly 1 3/4 miles southeastward of the point.

Soundings in Ngalapwe Chaung differ from charted depths. In 1964 there was a least depth of 15 3/4 feet (MLWS) in the channel leading to the piers located about 1 1/2 miles within the entrance of Ngalapwe Chaung. The least depth was on the axis of the range-line leading across the bar at the mouth of the creek.

NAVIGATIONAL AIDS.—Paungnetkyi Light

is shown from the west side of Laws (Paungnetkyi) Island.

A red can light buoy is moored close northeastward of Reliance Shoal.

Range beacons mark the channel which leads across the bar at the mouth of the Ngalapwe Chaung.

ANCHORAGES.—Anchorage is best afforded southeastward of Dalhousie Point in 9 to 10 fathoms, mud, with the pier bearing between 271° and 288°, about 1/2 mile distant. When anchoring in this vicinity regard should be had for the wreck and shoal southeastward of Dalhousie Point.

Anchorage is also afforded in Southhampton Road eastward of Dicey Shoal, but the holding ground, broken shells and stones, is not good.

Vessels infected with or suspected of yellow fever must anchor not less than 1/2 mile from the shore in any part of the harbor eastward of Dalhousie Point.

In the vicinity of the anchorage eastward of Dalhousie Point strong eddies occur at spring tides.

The anchorage in Wood Harbor is discussed in section 5A-29.

5A-32 DIRECTIONS.—Vessels from westward or northwestward should approach Kyaukpyu Harbor by steering 091° for Kyaukpandu and remain on that course until North Terrible bears more than 212°. When North Terrible bears more than 212° or when the north extremity of Saddle Island bears 119° course should be altered to 099° to enter the harbor, steering for Paungnetkyi (Laws Island) Light and passing southward of Giles Bank and North Shoal and northward of Dicey Shoal and Reliance Shoal. After passing Reliance Shoal course may be shaped to the anchorage southeastward of Dalhousie Point.

Vessels approaching from the southward may pass eastward of The Terribles. The approach should be made with the summit of Nasapo Kyun (19°39′N., 93°33′E.) in range 029° with the north point of Nakhaungbauk Kyun. Great caution is necessary on this range because of shoals, resulting from volcanic action, southeastward of The Terribles. When South Terrible bears 316° course should be altered to 001° to pass about 2 miles westward of Irrawaddy Rock; thence when the summit of Nasapo Kyun bears 040°, and is well open northwestward of Nakhaungbauk Kyun, it should be steered for on a course of 040° until Paungnetkyi Light bears 099°. Vessels may then follow the afore-mentioned directions given for entering the harbor.

5A-33 KYAUKPYU, situated near the shore about 3/4 mile southeastward of Dalhousie Point, is the headquarters of the Kyaukpyu District. In 1953 the town had a population of 7,335.

An iron pier, about 300 yards south-southeastward of Dalhousie Point has a depth of 12 feet alongside. About 3/4 mile east-southeastward of this pier a pipeline has been laid between a tanker berth and the shore. Vessels should not anchor near this pipeline.

A 240-foot all-weather jetty, safe for coastal vessels to berth alongside at any time, is located along the west bank of the Ngalapwe Chaung, about 1 1/2 miles within its entrance. Another jetty (pier) is located in this vicinity.

Drinking water, which requires boiling and filtering, can be obtained.

Kyaukpyu has regular sea communication with Rangoon and Calcutta. The town is connected with the main telegraph system of India.

PAUNGNETKYI ISLAND

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COASTAL FEATURES—LANDMARKS (CONTINUED)

5A-34 RAMREE ISLAND is about 43 miles long in a northwest and southeast direction and about 20 miles wide across its center, the widest part of the island.

WEST POINT (19°22'N., 93°28'E.), the westernmost extremity of Ramree Island, is located about 2 miles south-southwestward of Adams Point (sec. 5A-31).

The coast from West Point to Thames Point, nearly 15 miles south-southeastward of West Point, has a rocky appearance and rises steeply in a range of high hills. The most prominent summits on this range are OUTER PEAK, 420 feet high, NORTH PAPS, 455 feet high, and TREE SUMMIT, 420 feet high.

Outer Peak, about 1 mile southeastward of West Point, is comparatively bare. The range to the southward of Outer Peak has an elevation of 540 feet and is thickly wooded. BLACK HILL, about 2 1/2 miles northeastward of Outer Peak, and PIMPLE HILL about 4 1/2 miles southeastward of Outer Peak, derive their names from their appearance from seaward; they are easily identified when not obscured by the coastal range. North Paps, 5 miles southeastward of Outer Peak, is the most distinctive hill on this section of the coast. At its foot, a conspicuous bungalow stands on the coast near the village of Minbyin. BROWN HILL, nearly 5 miles south-southeastward of North Paps, is 376 feet high and so named because of its color. Tree Summit, about 1 mile eastward of Brown Hill, is easily identified by a tall tree on its summit.

Several detached above-water rocks and numerous scattered patches with depths of 3 fathoms and less lie inside the 5-fathom curve and up to 1 1/4 miles offshore along this section of the coast. A 4 1/2-fathom patch lies about 1 1/2 miles southward of West Point. Depths of 4 to 5 fathoms lie southeastward of Research Rock (sec. 5A-6) towards the coast. A rocky patch with a depth of 5 fathoms lies about 2 1/2 miles west-northwestward of Thames Point.

PART B. THAMES POINT TO CAPE NEGRAIS

5B-1 THAMES POINT (19°09'N., 93°36'E.), low-lying with some tall trees, is located on the west coast of Ramree Island, about 12 miles north-northwestward of the entrance of Cheduba Strait.

COAST—GENERAL

5B-2 The coast southward of Ramree Island to Cape Negrais is rocky and irregular. Numerous small bays indent this coast, but afford little shelter during the Southwest Monsoon.

From Andrew Bay southward, the land near the coast is hilly and mountainous; many peaks, some of them with elevations over 3,000 feet, are visible from seaward and serve as useful landmarks. The Arakan Yoma range rises from the mountainous country on the west edge of Burma. Southward of Taungnela (North Sharp Peak) the range is lower and terminates in the vicinity of Cape Negrais.

Ramree Harbor, Sandoway River, and Andrew Bay are of some importance.

DEPTHS—DANGERS

5B-3 Numerous small islands, rocks, and shoals lie inside the 100-fathom curve southeastward of Cheduba Island to a position (18° 00'N., 94°05'E.), about 20 miles westward of Bluff Cape.

Between Gwa Bay and Cape Negrais, numerous dangers also lie off the coast within the 20-fathom curve. St. John's Rocks and the Northwest Group of the Calventuras lie outside the 20-fathom curve.

Depths within the 10-and 20-fathom curves along the coast between Ramree Island and Cape Negrais for the most part are irregular.

OFF-LYING ISLANDS AND DANGERS

5B-4 NANTHA KYUN (Foul Island) (18°04' N., 94°05'E.), an active mud-volcanic island 551 feet high, is located about 20 miles west-northwestward of Bluff Cape. The island is

thickly wooded, but eruptive action has formed a bare lane which extends from the crater to the water on its west side. Flames were seen in 1908 to shoot about 500 feet into the air from the crater, westward of and below the summit. A LIGHT is shown from the summit of Nantha Kyun.

Good ANCHORAGE may be obtained in 8 to 10 fathoms, sand and mud, about 1 mile northward of Nantha Kyun. Shoal depths of less than 3 fathoms surround Nantha Kyun and are charted up to about 1/4 mile offshore.

The dangers lying eastward of Nantha Kyun can be avoided by passing within 3 miles eastward of the island.

BROUGHAM SHOAL, dangerous and rocky with a least depth of less than 6 feet, lies about 4 1/2 miles north-northeastward of Nantha Kyun. The sea usually breaks over Brougham Shoal. Detached shoal patches with depths of 6 to 9 fathoms lie up to about 2 miles northeastward of Brougham Shoal.

CARPENTER SHOALS consist of two separate shoal areas. The westernmost, with coral rock near its center and a least depth of 3 3/4 fathoms, lies about 11 1/2 miles north-northwestward of Nantha Kyun. The easternmost shoal, with a least depth of 2 3/4 fathoms, sand, lies about 3 miles east-southeastward of the westernmost shoal. Numerous coral heads and shoal patches with depths of 7 to 10 fathoms lie within a radius of 6 1/2 miles of the easternmost shoal. A rocky patch with depths of 8 to 10 fathoms lies about 9 miles north-northeastward of the same shoal.

Nerbudda Island and Nerbudda Shoal, about 8 miles northwestward of Carpenter Shoals, and other islands and dangers southeastward of Cheduba Island are discussed in sections 5B-14 through 5B-16.

NEW SHOAL, with a depth of 3 fathoms, rocky bottom, lies about 8 3/4 miles east-northeastward of Nantha Kyun.

SATELLITE LEDGE, with a depth of 14 fathoms, coral, lies about 12 1/2 miles east-northeastward of Nantha Kyun.

VESTAL SHOAL, with a least depth of 5 feet, coral, lies about 6 1/2 miles eastward of Nantha Kyun; ROBINSON SHOAL, about 1 3/4 miles eastward of Vestal Shoal, has a least depth of 4 feet, coral. Breakers usually mark Vestal and Robinson Shoals; the channel between them is deep, charted depths being 22 to 25 fathoms.

INVESTIGATOR LEDGE, a coral ledge with a least depth of 12 fathoms, lies about 3 1/2 miles southeastward of Nantha Kyun.

WILLIAM SHOAL, rocky and with a least depth of 2 1/2 fathoms about 6 1/2 miles westward of Bluff Cape (18°00'N., 94°26'E.), lies at the east end of a bank with depths of less than 20 fathoms.

THYNE BANK, with a least depth of 15 fathoms, WHITE BANK, with a least depth of 12 fathoms, lie about 15 miles south-southwestward and 16 1/2 miles southward, respectively, of Bluff Cape. Both banks are coral formations which lie outside the 20-fathom curve.

5B-5 ST. JOHN'S (CHURCH) ROCKS (17° 28'N., 94°20'E.) lie about 12 3/4 miles southwestward of Gwa Kyun (sec. 5B-26). Four rocks comprise the group, the largest of which is 40 feet high and resembles a church when observed from the northward. The group, steep-to at their north end, has shoal depths of 3 1/2 and 5 fathoms for about 1/2 mile southward of their south end.

THE CALVENTURAS (HGNETTAUNG) ISLANDS comprise the Northwest Group, located about 10 miles westward of Broken Point (16°55'N., 94°23'E.), and a southeast group. Two principal islands in the southeast group, North Island and South Island, lie 7 miles west-southwestward and 8 miles southwestward, respectively, of Broken Point.

The highest island of the Northwest Group is 125 feet high. In the southeast group, North Island is 130 feet high and South Island is 80 feet high. Their well-wooded summits form good landmarks.

Navigable channels lie between the Northwest Group and the southeast group and between the latter group and the mainland. The channel between North Island and South Island should not be attempted; a rock, which dries 7 feet, obstructs the channel midway between the islands and two large rocks lie close northward of South Island.

JUANITA SHOAL, a coral bank with a least depth of 16 fathoms, lies about 30 miles westward of Cape Negrais.

NAVIGATION

5B-6 Careful navigation is important, especially during the Southwest Monsoon, in the vicinity of the numerous dangers lying southeastward of Cheduba Island and westward of the coast between Andrew Bay and Bluff Cape.

Between Gwa Bay and Cape Negrais it is not advisable to navigate inside the 20-fathom curve when traversing this stretch of the coast.

TIDES—TIDAL CURRENTS

5B-7 Tides are semidiurnal along the coast between Thames Point and Cape Negrais.

Tidal currents in general along the Arakan Coast are discussed in section 5-4.

Tidal currents along the southwest side of Cheduba Island follow the general trend of the coast. Between the southeast end of Cheduba Island and Ye Kyun (Flat Island) there is a considerable in-draft. During the Northeast Monsoon the current may set to the southward.

The currents in the vicinity of the shoals lying westward of the coast between Andrew Bay and Bluff Cape are influenced and affected by the monsoons and the tides, both in velocity and direction. The current sets strongly across these shoals.

The current between Gwa Bay and Cape Negrais sets with the direction of the coast, northward or southward according to the prevailing monsoon, and barely exceeds a velocity of 1 knot.

WINDS—WEATHER

5B-8 See section 5-3.

COASTAL FEATURES—LANDMARKS

5B-9 ROCKY POINT (19°00'N., 93°41'E.), a low, rocky and reef-fringed point marked by a white pole BEACON 15 feet high, is located on the southwest side of Ramree Island, about 10 miles south-southeastward of Thames Point.

Between Thames Point and Rocky Point the coast forms a bight; depths of less than 5 fathoms are charted westward from the shore at distances up to 3 3/4 miles. A rock which dries 5 feet lies in the bight about 2 3/4 miles southeastward of Thames Point. Barn Rock, 8 feet high, lies close to the shore about midway between the points. An islet lies about 1/2 mile offshore 2 3/4 miles northwestward of Rocky Point.

CHEDUBA STRAIT

5B-10 CHEDUBA STRAIT lies between Ramree Island and Cheduba Island. The west entrance of the strait lies between Rocky Point and Searle Point, the north extremity of Cheduba Island which is located about 6 1/2 miles southwestward of Rocky Point. The strait has a minimum width of 4 1/2 miles, but the navigable channel is not nearly so wide. There is a least charted depth of 3 1/2 fathoms along the recommended track leading through Cheduba Strait.

DEPTHS AND DANGERS IN APPROACH.—BEACON ISLAND (18°56'N., 93°27'E.), 30 feet high and formed of stones, lies nearly 10 miles westward of Searle Point. MUN AUNG (Manaung) (Beacon Island) LIGHT is shown from the east summit of the island. A small white stone BEACON, 17 feet high, stands on the highest part of Beacon Island.

Mud volcanoes frequently raise islets and shoals in the vicinity of Cheduba Strait. These islets may disappear suddenly, leaving dangerous shoals.

Two islets, about 25 feet high and 400 feet long, were reported in 1919 to have formed about 6 and 8 miles, respectively, north-northwestward of Beacon Island. A shoal over which the sea breaks heavily during the Southwest Monsoon lies nearly 8 miles north-northwestward of Beacon Island and about 1 1/4 miles southwestward of the northernmost islet reported in 1919. Depths of 8 to 10 fathoms surround the shoal.

A depth of 9 fathoms, rocky bottom, is charted about 10 miles north-northwestward of Beacon Island.

A rock with a depth of 5 fathoms and over which the sea breaks in heavy weather lies about 6 miles north-northwestward of Beacon Island. In 1961, an islet 10 to 15 feet high and about 300 feet long east and west formed near this rock in a postion 5 1/4 miles north-northwestward of the east end of Beacon Island. A mud-volcano shoal, centered about

1/2 mile southeastward of the islet, has surrounding depths of less than 4 fathoms. The vicinity affected breaks heavily in a flat calm and is surrounded by large areas of discolored water in patches of irregular shape.

In 1936, a small volcanic islet was reported in a position 2 3/4 miles east-northeastward of the east end of Beacon Island. A rocky 10-fathom patch lies about 3 miles westward of the west end of Beacon Island.

ANCHORAGE.—Anchorage may be obtained in 5 to 6 fathoms, good holding ground, about 1 3/4 miles northeastward of Beacon Island with the lighthouse bearing about 215°.

5B-11 NORTHEAST SIDE OF CHEDUBA STRAIT.—ZIKHA TAUNG (18°56'N., 93°51' E.), the highest summit on Ramree Island, rises to an elevation of 1,003 feet about 10 miles east-southeastward of Rocky Point. DARK HILL, 260 feet high and wooded, is located near the coast about 2 3/4 miles eastward of Rocky Point. HELBY HUMMOCK, a small wooded hill about 3/4 mile south-southeastward of Dark Hill, shows up well from the northwestward. A dome-shaped hill, 403 feet high, close to the coast in a position about 4 miles northwestward of the south extremity of Ramree Island serves as a useful mark ahead for vessels entering the strait from the west-northwestward.

The south coast of Ramree Island forms a bight between Rocky Point and an unnamed point 4 miles southeastward of Rocky Point. Button Island lies about 1/4 mile from the coast nearly 9 miles east-southeastward of Rocky Point. The island, 115 feet high, is inconspicuous from the westward.

Shoal depths of less than 3 fathoms front the south coast of Ramree Island for distances up to 1 1/2 miles from about 1 1/4 miles southward of Rocky Point to 1/4 mile off Button Island. From Button Island to the south extremity of Ramree Island, a distance of 8 1/2 miles, similar shoal depths fringe the coast at distances of 1/4 to 3/4 mile. Numerous rocks lie off the coast within these distances.

MIDDLE GROUND, an extensive shoal area with depths of 2 1/4 to 3 fathoms, occupies about two-thirds of the channel to the eastward of the recommended track through Cheduba Strait between Sandy Point and the south extremity of Ramree Island. Between the west edge of Middle Ground and the shoal ground extending eastward from the east coast of Cheduba Island, the channel has a least width of about 1 mile and a least charted depth of 3 1/2 fathoms. Between the east side of Middle Ground and the west side of the south extremity of Ramree Island, the channel has a width of nearly 600 yards and a least depth of 3 1/4 fathoms.

5B-12 SOUTHWEST SIDE OF CHEDUBA STRAIT.—There is a mud volcano on the low northwest point of Cheduba Island. Between the northwest point and Searle Point, about 8 miles east-northeastward, and thence to Sandy Point (18°53'N., 93°45'E.), 8 miles east-southeastward of Searle Point, the north coast of Cheduba Island is low.

Shoal ground, with depths of 3 1/2 fathoms and less, extends as far as 2 3/4 miles off the north coast of Cheduba Island. Within the triangle formed by lines joining Beacon Island, Searle Point, and the northwest point of Cheduba Island is an area of foul ground with many large boulders, some of which are above water.

A patch, with a depth of 3 fathoms, lies about 3 miles south-southwestward of Rocky Point and is the westernmost of a line of shoals which stretch east-southeastward for nearly 5 miles and lie southward of the recommended track. The least depth over these shoals is about 1 1/4 fathoms.

A mud-volcano shoal, with a depth of 1 1/2 fathoms, lies about 1 3/4 miles northeastward of Sandy Point. This shoal lies only about 400 yards westward of the recommended track; great caution must be exercised when navigating in its vicinity.

Southward of Sandy Point, the east coast of Cheduba Island is low and thickly wooded for 8 miles, beyond which it becomes high for about 5 miles farther to the southernmost point of the island.

On Chaung (Cheduba Creek) enters the sea 2 miles southward of Sandy Point. A PAGODA, newly whitewashed every autumn and conspicuous at that time, stands about 1 mile west-northwestward of the creek entrance.

CHEDUBA VILLAGE is situated nearly 3/4

mile within the creek entrance; the village has telegraphic communication with the mainland.

Shoal ground, with depths of 3 fathoms and less, extends from 1 mile to 6 miles eastward from the east coast of Cheduba Island.

Taik Kyun (Tokwekwong) (Round Island) has an even-rounded summit 244 feet high and lies within the outer edge of this shoal ground, 3 1/2 miles from the coast and 10 miles south-southeastward of Sandy Point.

DIRECTIONS.—Ywathit Taung and Taungni Taung (sec. 5B-13), both on Cheduba Island, and the high hills on Ramree Island will be visible to vessels approaching Cheduba Strait from the northwestward. Helby Hummock and Dark Hill can be seen over the low ground of Rocky Point.

From a position about 5 1/2 miles westward of Rocky Point with Zikha Taung bearing 102° and Ywathit Taung bearing 170°, vessels should steer 109° on the recommended track indicated on the chart and towards the dome-shaped hill (sec. 5B-11) on Ramree Island. When Dark Hill bears 338° course should be altered to 158°. If Dark Hill is kept bearing not more than 338° astern, the mud-volcano shoal northeastward of Sandy Point will be cleared to starboard. When 2 miles have been made on the 158° course, a bare, blunt, conical hill will appear open westward of Dark Hill.

As the edge of the shoal ground which extends from the east coast of Cheduba Island is very steep in places, preference should be given to the eastern or Middle Ground side of the channel. When Taik Kyun bears 203° Middle Ground will be cleared. From abreast Taik Kyun the bare, blunt, conical hill and Dark Hill will be just visible over the horizon and will appear as a hill with twin summits.

CHEDUBA ISLAND

5B-13 CHEDUBA ISLAND, roughly triangular in shape, lies westward of the south extremity of Ramree Island. The island is well-wooded with a great amount of undulating country. The greater part of the island is cultivated and covered with foliage.

YWATHIT TAUNG (Centre Peak) (18°48′N., 93°37′E.), about 7 miles southward of Searle Point, is 565 feet high and conspicuous. TAUNGNI TAUNG (Pagoda Peak), 642 feet high, rises about 2 miles farther southward of Ywathit Taung. Two small pagodas stand on the summit of Taungni Taung. PALENGU TAUNG, 845 feet high and about 7 miles southeastward of Taungni Taung, marks the southernmost part of Cheduba Islands, being about 3/4 mile within the south end.

The north and east coasts of the island have been discussed along with the southwest side of Cheduba Strait in section 5B-12.

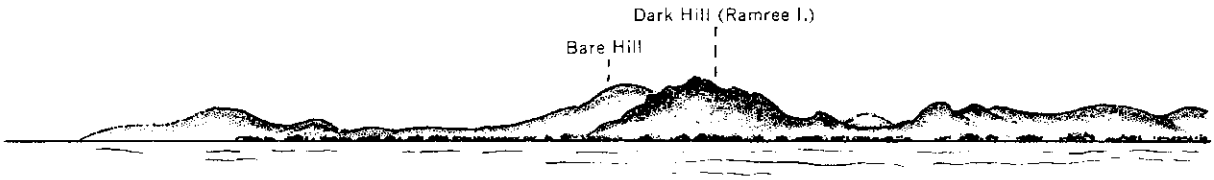
The high southwest coast of Cheduba Island, about 18 miles in length, is bold and fronted by sunken and above-water rocks. WEST HILL, 609 feet high and wooded, is located about 7 miles southeastward of the northwest point of the island.

HENRY ROCKS are a group of above-water and sunken rocks lying on a reef with their outer limits about 3 miles west-southwestward of the west point of Cheduba Island. The group includes a pinnacle rock, 17 feet high, and near the southwest end of the reef are two rocks, each 4 feet high.

OYSTER ROCK, an above-water rock, lies about 1 3/4 miles southeastward of Henry Rocks.

A rock, awash at low water, lies about 1 1/4 miles offshore westward of West Hill.

Several scattered 10-fathom depths are



BARE HILL OPEN WESTWARD OF DARK HILL

Bearing 338°

charted outside the 10-fathom curve up to 2 1/2 miles offshore, southwestward of Taungni Taung.

Pyramid Bay, near the south end of the island and about 2 1/2 miles westward of Palengu Taung, is the only indentation on the southwest coast. The bay affords good anchorage to native craft during the Northeast Monsoon. Natmyat Kyauk (Pyramid Rock), a pinnacle rock 202 feet high, lies off the entrance of Pyramid Bay.

A reef marked by numerous above-water rocks extends up to 2 miles southward from the south end of Cheduba Island.

ISLANDS AND DANGERS SOUTHEASTWARD OF CHEDUBA ISLAND AND APPROACHES TO RAMREE HARBOR

5B-14 YE KYUN (Flatt Island) (18°38'N., 93°47'E.), Taung Kyun (Hill Island), and numerous rocks lie on foul ground which extends about 8 miles southeastward from the south extremity of Cheduba Island.

Ye Kyun lies near the edge of the foul ground and about 3 miles southward of Taik Kyun (sec. 5B-12). Ye Kyun, reef-fringed, is generally low, but rises in the center to an elevation of 105 feet. Several detached reefs lie between Ye Kyun and Taik Kyun. A detached reef lies about 1/2 mile off the east side of Ye Kyun and eastward of the highest part of the island. A reef which covers extends about 1 1/4 miles south-southeastward from the south end of Ye Kyun and comprises a portion of the outer edge of the foul ground.

Taung Kyun, 16 feet high, lies about 3/4 mile southward of the south end of Ye Kyun. South Rock, which dries to 8 feet, lies on the outer edge of the foul ground and about 1/2 mile southward of Taung Kyun.

There is no clear passage between Cheduba Island and Ye Kyun. Taung Kyun should not be approached within a distance of 2 miles from any direction.

5B-15 RAMREE HARBOR lies between the southeast side of Ramree Island and the mainland. Ramree Roads and the entrance of the harbor are approached from the northwestward through Cheduba Strait (sec. 5B-10) and from the southwestward through Heywood Channel, Childers Channel, and the channel westward of Nerbudda Shoal, all of which lie between numerous islands and dangers.

CHANNELS—DEPTHS—DANGERS.—West Shoal (18°30'N., 93°50'E.), a group of sunken rocks, lies about 5 miles south-southeastward of Taung Kyun. The rocks are sometimes visible at low water when the sea breaks over them. Depths of 11 to 14 fathoms surround the shoal. Taung Kyun bearing more than 338° leads westward of West Shoal.

Sail Rock, 8 feet high, lies nearly 4 3/4 miles east-southeastward of Taung Kyun. A rock awash lies about 1/2 mile south-southeastward of Sail Rock. False Rock, 10 feet high, lies about 4 1/2 miles north-northeastward of Sail Rock. A chain of sunken rocks, reefs, and shoals join Sail Rock and False Rock; there is no safe passage between them. Foul ground extends about 1/2 mile northward from False Rock; depths of 3 1/4 to 8 fathoms lie off the edge of this foul ground.

HEYWOOD CHANNEL lies between Taung Kyun and Ye Kyun on the northwest and West Shoal, Sail Rock, False Rock, and the foul ground between Sail Rock and False Rock on the southeast. In the narrowest part between the 5-fathom curves northwestward of False Rock the channel has a width of about 3/4 mile and a least depth of 5 1/4 fathoms. Heywood Channel is not recommended.

UNGUAN ISLAND (18°26'N., 93°55'E.), about 11 miles southeastward of Taung Kyun, is 130 feet high with a dense clump of trees on its summit. Foul ground surrounds the island and extends up to 1 mile eastward and southeastward from it. Depths of 5 fathoms and less lie within 1 1/4 miles northeastward of Unguan Island. OHNTABIN KYUN (Unguan Island) LIGHT is shown from a position near the center of the island.

East Reef, about 4 miles north-northeastward of Unguan Island, dries to about 4 feet. Depths of 5 fathoms and less extend about 3/4 mile northeastward from the reef.

Cutters Patch, a small rocky shoal with a least depth of 2 1/2 fathoms, lies about 2 miles north-northwestward of Unguan Island.

Three patches with depths of 10, 9, and 7 fathoms lie about 1 1/2 miles westward and 2 and 3 miles west-southwestward, respectively, of Unguan Island. A 6 1/2-fathom rocky patch is charted 4 1/2 miles south-southwestward of Unguan Island.

CHILDERS CHANNEL lies between West Shoal, Sail Rock, and False Rock on the northwest and Unguan Island and East Reef on the southeast. The channel, nearly 4 miles wide with a least depth of 9 fathoms, is recommended when West Shoal is breaking.

Nerbudda Shoal, centered about 5 miles southeastward of Unguan Island, is an extensive shoal with general depths of 6 to 10 fathoms, but shoal depths of 3 to 4 3/4 fathoms lie near its center. A least depth of 1 1/2 fathoms lies near the northwest edge of the shoal about 4 1/4 miles east-southeastward of the south end of Unguan Island.

5B-16 Nerbudda Island (18°21'N., 93°56'E.), a mud volcano, lies at the southwest end of Nerbudda Shoal. In 1909 Nerbudda Island was about 600 yards in extent and 1 foot high with the sea breaking over it; at that time it was thought that Nerbudda Island would not long remain visible at high water for any length of time.

A coral patch with a least depth of 8 fathoms lies about 2 3/4 miles southwestward of Nerbudda Island. Two 10-fathom patches lie between the 8-fathom coral patch and Nerbudda Island.

The CHANNEL between Unguan Island and Nerbudda Shoal is nearly 3 miles wide at its narrowest part and has a least depth of 10 fathoms. This channel, well marked by Unguan Island and the light on the island, is used frequently.

The dangers southeastward of Nerbudda Shoal are discussed in section 5B-4.

Osprey Rocks, 8 feet high, lie on a shoal with depths of less than 3 fathoms and located about 5 1/2 miles southeastward of Magyi Kyun (18°44'N., 94°00'E.), an island in the harbor entrance.

Gungasager Rocks, 3 feet high, lie at the southwest end of a shaol with a depth of less than 5 fathoms, about 10 miles southeastward of Magyi Kyun. Foul ground with depths of 3 3/4 to 4 1/4 fathoms lies about 1 1/2 miles northward of Gungasager Rocks.

Pantam Rocks, the northwesternmost above-water rock which is 2 feet high, lie about 4 miles east-northeastward of Osprey Rocks.

RAMREE HARBOR (19°00'N., 94°00'E.)

5B-17 RAMREE HARBOR comprises the estuary of the Kaleindaung River, which flows into the sea between the south extremity of Ramree Island and the mainland to the eastward.

A group of islands obstructs and divides the entrance of the harbor into two channels, the east and west entrances. The west or main entrance channel is known as The Gates. Ramree Roads lies about 5 miles southwestward of The Gates.

TIDES—TIDAL CURRENTS.—Tides in Ramree Harbor are semidiurnal.

TIDAL HEIGHTS ABOVE *CHART DATUM—Searle Point, Cheduba Island.—MHWS 9.3 feet, MLWS 1.3 feet; MHWN 6.9 feet, MLWN 3.7 feet. *H.O. Chart 3709.

In the harbor at springs the flood current sets northward and the ebb current southward at a velocity of 3 knots; in The Gates at the entrance of the harbor the tidal current sets in the direction of the channel at velocities of 3 to 4 knots.

ISLANDS IN THE RAMREE HARBOR ENTRANCE.—Magyi Kyun, about 7 miles south-southeastward of the south extremity of Ramree Island, is the southernmost island of the group of islands in the harbor entrance. The island, 261 feet high with a whale-back shape, is surrounded by foul ground. Nyaungbin Kyun lies about 1/2 mile southwestward of Magyi Kyun and marks the southwest edge of the foul ground which surrounds the latter island. Tangagyochaung Islet lies about 1/2 mile westward of the west point of Magyi Kyun; foul ground extends about 1 mile farther westward from Tangagyochaung Islet.

Sagu Kyun, 350 feet high near its southwest side, is the largest and northernmost island in the harbor entrance. The island is fringed by a reef on its east, south, and west sides with numerous offshore rocks lying on the foul ground which extends from the above three sides of the island. Channel Clump, a lone conspicuous clump of trees, 200 feet high, located near the north shore of Sagu Kyun about 1 1/4 miles west-southwestward of the north point of the island, forms a useful landmark for the Gates from the south-

westward. Big Rock, 60 feet high, lies on the foul ground close off the south side of Sagu Kyun.

Kyuntalaung (Adams Island), 155 feet high, lies between Sagu Kyun and Maggi Kyun.

5B-18 DEPTHS—DANGERS—BEACONS.—Between the 5-fathom curves in Ramree Roads south-southwestward of The Gates there is a least charted depth of 5 1/4 fathoms. Elsewhere in the best water in the approach to The Gates, depths range from 5 1/2 to 24 fathoms. Fishing stakes shown on the chart may encumber and constitute dangers in the approach to the harbor entrance.

The Gates, about 1 mile wide, lies between the south extremity of Ramree Island and the north shore of Sagu Kyun. Channel depths in The Gates for the most part are deep, ranging from 5 1/4 to 36 fathoms. Harbor depths for about 10 miles within The Gates range from 5 1/2 to 11 fathoms.

Alligator Rocks, which dry, lie near the north shore of Sagu Kyun, about 1 1/4 miles within the harbor entrance. A reef extends about 1 mile north-northeastward from the north part of the east side of Sagu Kyun. A BEACON marks the northeast extremity of this reef about 3/4 mile northeastward of the north point of Sagu Kyun. A 1 3/4-fathom patch lies about 1/4 mile northwestward of the beacon.

The east entrance of the harbor, between the east side of Sagu Kyun and the mainland to the eastward, is encumbered with mud and sandbanks, through which several channels accommodate only fishing vessels and small craft.

Dragon Shoal, parts of which dry, is about 4 1/4 miles in extent in a north-northeastward direction from a position about 1/2 mile northward of the beacon which marks the reef extending northeastward from Sagu Kyun. White Rock, 3 feet high and one of a group of above-water rocks on Dragon Shoal, lies about 3 1/2 miles north-northeastward of the above mentioned beacon. A rock which dries lies a little more than 1/2 mile north-northwestward and a sunken rock lies nearly 1 mile north-northeastward, respectively, of White Rock. Shoal depths of 2 to 3 1/2 fathoms are charted between these two rocks.

Two white marks stand on the west shore of the harbor, about 1 1/4 and 3 3/4 miles north-northeastward, respectively, of the south extremity of Ramree Island. Rocky patches with depths of 2 3/4 to 3 1/4 fathoms lie about 3/4 mile eastward of the white mark 1 1/4 miles north-northeastward of the south extremity of Ramree Island. The fairway of the channel between these rocky patches and the west edge of Dragon Shoal is about 3/4 mile wide with depths of 5 3/4 to 10 fathoms.

Flat Reef, which covers at high water, lies between the north end of Dragon Shoal and Ramree Island; the rocky reef is steep-to except on its south side. BEACONS, which mark the southeast and northwest sides of Flat Reef, stand about 1 mile northward and 1 1/4 miles north-northwestward, respectively, of White Rock. Flat Reef may be passed on either side; the 400-yard wide channel between the reef and Dragon Shoal is generally used.

Low Islet, marked by a BEACON and steep-to on its east side, lies about 2 1/4 miles northward of Flat Reef and about 1/2 mile southeastward of Kyangyaung Point, a bluff, 100 feet high, on the west shore of the harbor, about 8 miles north-northeastward of the south extremity of Ramree Island.

A rocky patch, nearly awash at low water springs, lies about 3/4 mile northward of Low Islet; this patch is about midway between Low Islet and a third white mark on the west shore about 1 1/2 miles north-northwestward of Low Islet.

Oyster Rock, marked by a BEACON, covers at high water springs and lies about 3 miles northward of Kyangyaung Point.

Cutters Rock lies about 1 mile northward of Oyster Rock. For about 4 miles northward of Cutters Rock to a postion off the entrance of the Ramree River there are depths of 3 1/4 to 4 fathoms, but the channel is narrowed by mudbanks.

Middle Bank lies about 1 mile southwestward of an island located 3 miles eastward of the entrance of Ramree River. This bank partly dries and has a group of rocks awash on its west side, about 1 3/4 miles eastward of the river entrance.

Nepal Rock, with a least depth of 1 1/2 fathoms, lies about 3/4 mile eastward of the entrance of the Ramree River; the rock is sometimes marked by a swirl.

Between Nepal Rock and the narrow entrance of Mingaung Chaung, about 2 miles farther northward, there are depths of 4 to 7 fathoms in the fairway.

Fishing stakes shown on the chart and those that are uncharted may constitute a hazard at various positions in the harbor.

ANCHORAGES.—There is excellent anchorage in depths up to 10 fathoms in all parts of Ramree Harbor not encumbered by rocks, shoals, and fishing stakes.

Anchorage in about 6 fathoms in the channel between the west side of Dragon Shoal, and the west shore of the harbor is shown on the chart about 3 3/4 miles north-northeastward of the south extremity of Ramree Island.

5B-19 DIRECTIONS.—Vessels may approach Ramree Harbor from the southward and in such case the channel between Unguan Island and Nerbudda Shoal is recommended. Unguan Island must not be brought to bear less than 350° until well northward of Nerbudda Island, when a 046° course may be steered through midchannel.

Vessels approaching from the southeastward should pass southwestward of Gungasager Rocks and Osprey Rocks at distances of 2 and 2 1/2 miles, respectively. Vessels should pass between 2 1/2 and 4 miles westward of Magyi Kyun and a northerly course towards The Gates then steered, taking care to avoid fishing stakes in the near approach to the entrance of the harbor. A course of 054° leads through The Gates in midchannel.

Thence, when the north point of Sagu Kyun bears about 140° course should be altered to the north-northeastward and the westernmost of the two clumps of trees on the north coast of Sagu Kyun kept bearing 208° astern. This leads between Dragon Shoal and the shoals and rocky patches lying off the Ramree Island shore and between Dragon Shoal and Flat Reef. Vessels should be kept to the deeper water towards Flat Reef. Caution is advised. Having passed Flat Reef, course should be shaped to pass about 1/2 mile eastward of Low Islet and thence at similar distances eastward of Oyster Rock and Cutters Rock, taking care to avoid any fishing stakes.

When northward of Cutters Rock, vessels approaching the entrance of the Ramree River should keep about 3/4 mile off the west shore of the harbor. Caution is necessary between White Rock and Flat Reef and in the vicinity of Oyster Rock, Cutters Rock, and Nepal Rock.

Mingaung Chaung connects the head of Ramree Harbor with the inner part of Kyaukpyu Harbor (sec. 5A-27) via Fletcher Hayes Strait. Vessels drawing 8 feet or less can use this channel.

5B-20 RAMREE RIVER AND VILLAGE.—The Ramree River (Tan Chaung) has its entrance nearly 8 miles northward of Kyangyaung Point and about 17 miles within The Gates. At ordinary high water, vessels drawing 9 feet or less can enter the river and proceed to within 1 1/2 miles of the village of Ramree. Local knowledge is required. A road connects the village with a wharf which is located 5 miles within the river's entrance. Local craft maintain regular sea communication with Kyaukpyu, Cheduba, and Sandway.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5B-21 The entrance of the shallow KAYAING RIVER (18°45'N., 94°09'E.) lies about 11 miles southeastward of the north point of Sagu Kyun.

A series of long, low islands forms the coast for about 14 miles south-southeastward of the entrance of the Kayaing River to the entrance of the Sandoway River (Sandoway Chaung). The Kyaukpyu mountain range backs this part of the coast. The southwest point of Singaung Kyun, the southernmost island of this section of the coast, is located on the north side of the entrance of the Sandoway River. A rest house stands on the southwest point.

Several detached reefs and rocks which dry lie between the entrance of the Kayaing River and Magyi Kyun (sec. 5B-17), about 7 miles westward of the entrance. These dangers may best be located on the chart.

Whalers Rock, awash, lies about 2 1/2 miles west-northwestward of the north end of Singaung Kyun and about 2 miles offshore.

The north end of Singaung Kyun is located about 3 1/2 miles northward of the southwest point of the island.

Singaung Reef, on which are numerous rocks, some of which dry, extends about 2 miles southwestward from the north end of Singaung Kyun.

Drunken Sailor Rock, a patch which nearly dries, lies about 2 miles westward of the southwest point of Singaung Kyun. The rock breaks at low water; at other times it may be seen under certain conditions of tide and wave height. A drying sandspit extends westward from the southwest point of Singaung Kyun towards Drunken Sailor Rock. Sunken rocks and shoal depths lie between the sandspit and Drunken Sailor Rock, all of which lie on the north side of the entrance of the Sandoway River.

Zalat Taung, an island 171 feet high on the south side of the entrance of the Sandoway River, is located about 3/4 mile southwestward of the southwest point of Singaung Kyun. Rocks and foul ground fringe Zalat Taung on all sides; these dangers extend about 3/4 mile south-southwestward from the west end of the island. A 5-fathom patch is charted about 1/2 mile southwestward of the southwest edge of the foul ground which extends south-southwestward from the west end of the island.

Singyat Kyun lies southeastward of Zalat Taung; a narrow, rock-filled channel lies between these two islands.

Gaw Taung, a hill 553 feet high, rises near the coast about 3 miles southeastward of the Sandoway River entrance. Gaw Taung is a good landmark, being the highest hill along this section of the coast.

ANCHORAGES.—An open anchorage with depths of 6 fathoms, mud bottom, lies about 1 1/4 miles northward of Drunken Sailor Rock with the rest house on Singaung Kyun bearing 120°, distant 2 1/2 miles.

Vessels with local knowledge may find good anchorage about 3/4 mile southward of Drunken Sailor Rock during the Northeast Monsoon; during the Southwest Monsoon this anchorage is exposed and dangerous.

When the wind is westward of north, a heavy surf breaks on the coast in the vicinity of the Sandoway River entrance.

SANDOWAY RIVER (CHAUNG) (18°33'N., 94° 13'E.)

5B-22 SANDOWAY RIVER is entered between the drying sandspit, which extends westward from the southwest point of Singaung Kyun, and Zalat Taung Island. The river is tidal for a short distance above the town of Sandoway. Vessels drawing 8 feet can ascend the river at ordinary high water from its entrance to within a distance of 4 miles of Sandoway. Boats drawing 3 feet can proceed the entire distance of 15 miles to the town. Sandoway, as a port, is considered closed during the Southwest Monsoon.

WINDS—WEATHER.—From November to February the winds are light; from about the middle of May to the end of October squalls and thunderstorms may be expected to occur. Dense fogs occur during the morning and evening from February to May.

DIRECTIONS.—Vessels entering the Sandoway River should approach with the rest house on the southwest point of Singaung Kyun bearing about 081°. This leads southward of Drunken Sailor Rock and through the fairway of the entrance. When the summit of Zalat Taung Island bears 181°, course should be altered to southward to round the sandspit which fronts the rest house.

SANDOWAY.—Sandoway, headquarters of the Sandoway District, is situated on the west bank of the river on low ground surrounded by hills. In 1953 the town had a population of 5,200. There is communication by sea with Chittagong and Rangoon via Andrew Bay (sec. 5B-24), except during the Southwest Monsoon. Steam launch service is maintained between the town and the roadstead. Sandoway is connected with the main telegraph system of India.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5B-23 The low, sandy, and rock-fringed coast for about 9 miles south-southeastward of GAW TAUNG (18°30'N., 94°16'E.) to abreast Apaw-ye Kyun affords little shelter. Isolated hills and ranges of hills back the low coast at various distances inland. A bight in the

south part of this section of the coast and northward of Apaw-ye Kyun is mostly foul.

APAW-YE (Apau-ye Kyun) (18°23'N., 94° 19'E.), a bluff island, is 295 feet high. A 3 1/2-fathom patch lies about 2 3/4 miles north-northwestward of Apaw-ye Kyun and about 1 3/4 miles offshore. Detached rocks, which dry, lie about 2 miles north-northwestward of Apaw-ye Kyun and about 1 1/4 miles offshore. In 1933 mud volcanoes were reported to exist about 3/4 mile south-southwestward and 1 3/4 miles west-southwestward, respectively, of the west point of Apaw-ye Kyun.

About 1 mile southeastward of Apaw-ye Kyun an unnamed point marks the north side of the entrance of Andrew Bay. LONTHA LIGHT is shown from this point.

ANDREW BAY (18°20'N., 94°21'E.)

5B-24 ANDREW BAY is entered between the above mentioned unnamed point and Money Point, about 3 miles south-southwestward of the unnamed point. Money Point, on the south side of the entrance, is the extremity of a small peninsula which rises to a height of 395 feet in Money Summit, about 3/4 mile south-southwestward of the point. Money Summit, topped with detached trees, forms a conspicuous landmark easily identified from seaward.

Mills Patch, a mud-volcano shoal with a depth of 3 1/4 fathoms, lies about 4 1/2 miles westward of Money Point and is a danger to vessels making Andrew Bay. Depths of 7 fathoms are charted close eastward and southeastward of Mills Patch. An 8-fathom patch and a rocky 9-fathom patch lie about 1 1/4 miles southward and 1 1/2 miles southwestward, respectively, of Mills Patch. Otherwise, surrounding depths in the vicinity of Mills Patch range from 14 to 19 fathoms.

Depths are regular in the near approach to Andrew Bay. From a position about 10 miles westward of and to the entrance of the bay, depths decrease gradually from 20 to 10 fathoms.

The central part of Andrew Bay, with depths of 4 to 9 fathoms, is clear of dangers and affords good anchorage in fine weather. The holding ground is good, but the anchorage is exposed to the full force of the Southwest Monsoon. Shelter from the monsoon can be obtained in Mayo Bay, the southeast part of Andrew Bay, but the anchoring room is restricted by a 2 3/4 fathom patch in the middle of Mayo Bay.

In 1952, depths were reported less than charted in Andrew Bay.

Sandoway Bay, a small indentation close eastward of the unnamed north entrance point of Andrew Bay, has a small stone landing jetty which is connected by road with the town of Sandoway, located about 6 miles northward of Andrew Bay. There is telephone communication; a well of good water is located on the shore.

BUOY.—A black can buoy with a white band and a white staff and globe topmark is moored about 3/4 mile south-southeastward of the light structure on the north entrance point of Andrew Bay. The buoy marks the edge of the shoal water on the northwest side of the approach to Sandoway Bay.

MAYO BAY.—Construction of facilities for an all-weather port, sheltered from the monsoon winds, was reported (1965) underway in Mayo Bay.

A stone pier 350 feet long and 24 feet wide will have a pontoon berthing head 240 feet long and 20 feet wide with a depth alongside of at least 18 feet. Vessels up to 3,000 d.w.t. will be accommodated.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5B-25 SOUTHWARD OF MONEY POINT (18°19'N., 94°20'E.) for about 4 1/4 miles, the west face of a large promontory forms the coast. Mawyon (Hmaugon) Pagoda, located about 3/4 mile east-southeastward of the southwest point of the promontory, is conspicuous from seaward when the sun is shining on it.

Dangerous foul ground with numerous above-water and sunken rocks fronts the west coast of the promontory for about 3 1/2 miles westward of the shore. The outermost